A Database Publication

ATARI USER

Vol. 3 No. 6 October 1987 £1



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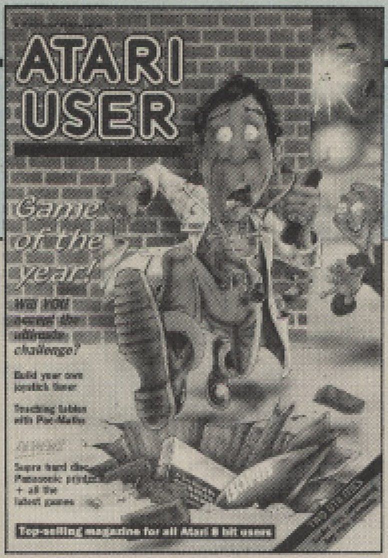
REVIEWS

Supra hard disc
Panasonic printer
+ all the latest games

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Top-selling magazine for all Atari 8 bit users

Contents



Vol. 3 No 6 October 1987

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Telecom Gold: 72:MAG001
Telex: 265871 MONREF G
Quoting Ref. 72:MAG001
Prestel Mailbox: 614568383

Published by:
Database Publications Ltd,
Europa House, 68 Chester Road,
Hazel Grove, Stockport SK7 5NY.

ABC 33,573 January-June, 1986

Subscription rates for 12 issues, post free:
£12 – UK
£15 – Europe (incl. Eire)
£30 – Overseas

ISSN 0266-545X

"Atari User" welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accommpanied by cassette tape or disc. Please enclose stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication by Database Publications Ltd will be on an all-rights basis.

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News trade distribution: Europress Sales and Distribution Limited, Unit 1, Burgess Road, Ivyhouse Lane, Hastings, East Sussex TN35 4NR. Tel: 0424 430422.

Get it right!

Get it Right!

All major listings in this issue are accompanied by checksums to help overcome typing mistakes. For full details of how they work, see the article in the August 1986 issue of *Atari User*.

Link your Atari to the outside world with...

MicroLink



Electronic mail – The cheapest and fastest form of communication possible. It costs the same to send a message to one mailbox as to 500!

Telex – Link up with 96,000 telex subscribers in the UK and 1.5 million worldwide. You can even send and receive telexes after office hours or while travelling.

Telemessages – Type in your message before 8pm and delivery is guaranteed by first post the next day (except Sunday), anywhere in the UK and USA.

Tele-booking – Reserve train and theatre tickets, check flight details worldwide, or order from a vast range of products – from flowers to floppy discs.

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Company searches – Obtain facts about any British limited company in seconds, and fully analysed financial information on over 100,000 major companies.

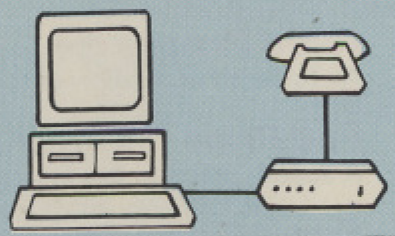
Typesetting – Send copy from your word processor together with details of type size and style, and you'll receive pages ready for printing within 24 hours.

News – Use the powerful search commands to pinpoint vital business information from the world's leading news services, newspapers and periodicals.

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When you join MicroLink you've got the world of communications at your fingertips – 24 hours a day. You'll have immediate access to ALL the facilities offered by Telecom Gold ... and a great deal more besides.



Two recommended packages

If you have an 850 interface:
Pace Nightingale manual modem + cable (£116.15) PLUS Mini Office II (£19.95).
Total price: £136.10.

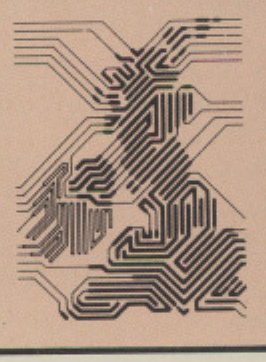
If you don't have an interface:
Miracle WS2000 V21, V23 modem + Datatari interface + cable + Viewterm software.
Total price: £149.95.

With either combination you can also log on to other databases and bulletin boards all round the world.

All you need – apart from your Atari – is a modem, which plugs into your telephone wall socket, plus suitable communications software.

We have provided two possible options on the left.

Whichever equipment you use, you will be able to call MicroLink, open your mailbox, save to disc any messages waiting for you, and disconnect in as little as two minutes.



More than 90 per cent of subscribers can connect to the MicroLink computer at local call rates.

TO FIND OUT MORE
Fill in the coupon and send it to the address below. You will receive full details of services and costs, together with an application form. Complete this and within days you and your Atari will be able to use all the services of MicroLink and Telecom Gold.

Please send me full details about MicroLink, and information sheets about the following hardware and software options (please tick):

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Address ____________________

____

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ATU10

PRIZE CRASH

A NATIONWIDE electronic mail competition offering a magnum of champagne as the star prize resulted in a giant hangover when the winner unwittingly caused the software in the central computer to crash.

When ex San Francisco police officer Cameron (Cam) Lacey posted the 10,000th message on the MicroLink bulletin board from his office in Grimsby, all that should have happened was that he received a three litre bottle of Moet & Chandon to mark the milestone achievement.

Unfortunately what no one realised at that time was that the BBS system was only designed to cope with a data field of four characters – up to and including 9,999.

So when just one additional message was received, it was as if a giant fuse had blown.

In fact, the only person left with a grin on his face was Cameron Lacey.

Mind you – according to MicroLink boss Derek Meakin – it should have been a sheepish one. For it seems that Cam cheated a little bit.

"He'd obviously written a program that started sending identical messages just as the number of messages on the board was approaching the 10,000 mark".

All the messages said was: "Is this the one?"

Atari gears up for Xmas boom

MASSIVE sales of video games and consoles have been predicted by Atari for the Christmas market.

The prediction has been made following a huge increase in sales of video consoles and games in the American market last year.

Figures just released show that the company's turnover was up by 39 per cent with profits of $13.5 million on sales of $70 million in just three months. The American success is expected to be mirrored here this Christmas now that Atari's video games machines are to be sold in all the High Street multiples.

"For the past three years if parents with children aged 10 and under wanted a video games machine then they had to buy an expensive computer to do the job", said an Atari spokesman.

"With the 2600 video console retailing at £49.99 parents have an inexpensive way of buying a games machine and getting their children used to the idea of using a computer".

The two other machines which will also be on sale in the multiples are the new 65XE computer games console for £79.99, and the XE computer games system for £119.99, made up of the console and a keyboard.

The list of games for the consoles grows almost daily. Atari's own label software catalogue for the machines is already speeding towards the 100 mark.

Lighter touches

HUMOUR has been injected into the latest Magnetic Scrolls adventure game released for the Atari 8 bit by Rainbird.

Jinxter is set in Aquatania – a neighbouring country to the setting of top-selling The Pawn.

Rainbird (01-240 8838) say that the light hearted game is a quest for magic stolen by witches and hidden down seven mineshafts.

Database heads for the States

A NEW transatlantic deal will see a British software house reverse recent trends by establishing a major presence in the United States.

Database Software has reached agreement on a joint venture with ShareData, pioneers of budget packages in the States and a public company valued at $28 million.

The end result is the formation of Database Software Inc. in Phoenix, Arizona.

The new corporation aims to market the best British and European titles through ShareData's 22,000 outlets in North America.

Database Software is part of the Database Group, the UK's leading publisher of computer magazines including Atari User.

As a software house, it first sprang to prominence in Britain in October, 1984, with the release of Mini Office – an Atari 8 bit favourite.

Database Software is today recognised as one of the fastest growing companies in its field in the UK. The last 12 months have seen its turnover increase more than five times.

Similarly, ShareData in the States has a track record second to none.

It has become the pacesetter for the American industry, recording sales of more than 500,000 units in the last three months.

Michael Meakin, joint managing director of Database, flew to Arizona to complete the British-American deal.

"We have spent a long time looking for a suitable partner in the States to make us a truly international company", he said, "and in ShareData we believe we have found the perfect answer.

"Now the search is on to find the hottest software properties in Europe and Britain to sell in America.

"It is a huge market with an insatiable thirst for good software", said Michael Meakin. "We intend to satisfy that demand with the help of the wealth of excellent software authors over here".

Playing to win

ATARI's $67 million takeover of American retail chain The Federated Group is the start of a new era, says chairman Jack Tramiel.

"Atari is going to be an international electronics company", he said. "We want to expand into basic production and distribution and the vertical market in computers".

Speaking of his admiration for American WWII hero General George Patton, Tramiel said: "In business, whatever we do we go out there to win, not play the sport.

"We have the best product, the best personnel and the best store locations to make sure we win".

As part of his expansion plans, Tramiel is currently negotiating with several electronics companies about moving into semiconductor manufacturing.



Gnome on the Range

THE gnerds at Level 9 Computing have been taken over by a gnome, according to recent correspondence discovered in a hollow oak.

Don't tell the dozy-looking lads in the picture that they're posing with a cardboard cutout – they believe it is Ingrid Bottomlow, their new managing directress and heroine of the latest Level 9 offering for Atari 8 bit machines.

Called Gnome Ranger, it is a three-part recreation of an epic journey with multi-player puzzles and a lot of what Level 9 calls "amusing text".

Characters, who all have their own lives, can be organised and ordered about by the player and there's a 48-page Journal to help. Price £9.95 from Level 9 (0344 487597).

It's word perfect

BRITISH computer users can now have access to what is claimed to be the biggest and most up-to-date multi-lingual dictionary in the world.

And it is already being viewed as a major breakthrough for groups as diverse as businessmen faced with foreign correspondence through to schoolchildren struggling with homework.

It is all part of a new service being offered by MicroLink, the UK's fastest growing electronic mail network.

Sitting at their keyboards, all subscribers have to do is type in a word or a complete phrase and the Great European Dictionary does the rest.

Housed in an EEC sponsored mainframe computer in Luxembourg, the electronic dictionary is the result of a massive collaboration between language experts throughout the community.

The Great European Dictionary consists of more than 380,000 words and phrases in English, German, Danish, Dutch, French, Italian, Portuguese and Spanish.

Such is the sophistication of the computerised language facility that it offers translations from any one of these languages into any other – or into more than one at the same time.

Nor does the service confine itself to straightforward translations. It also provides detailed explanations of the word or phrase, together with relevant notes about how and where it should be used – both in English and foreign languages.

"Such explanations in the foreign language constitute an invaluable source of material for translators", says Derek Meakin, head of MicroLink.

"As it is being continually amended and updated it is far more accurate and up-to-the-minute than any conventionally printed dictionary".

THE GALLUP CHART TOP 20 ATARI SOFTWARE

THIS MONTH	LAST MONTH	TITLE (Software House)	PRICE
1	●	**DECATHLON** *Firebird*	1.99
2	2	**MILK RACE** *Mastertronic*	2.99
3	1	**GAUNTLET** *US Gold*	9.95
4	●	**LIVING DAYLIGHTS** *Domark*	9.95
5	20	**AMAUROTE** *Mastertronic*	2.99
6	17	**GUN LAW** *Mastertronic*	1.99
7	4	**HOVVER BOVVER** *Mastertronic*	1.99
8	3	**MICRO RHYTHM** *Firebird*	1.99
9	●	**JACKLE AND WIDE** *Bulldog*	1.99
10	●	**FRENESIS** *Mastertronic*	1.99
11	●	**NINJA** *Mastertronic*	1.99
12	9	**SILENT SERVICE** *Microprose/US Gold*	9.95
13	●	**BOULDERDASH** *First Star/Prism*	2.99
14	16	**LEADERBOARD** *Access/US Gold*	9.95
15	7	**COLONY** *Bulldog*	1.99
16	5	**UNIVERSAL HERO** *Mastertronic*	1.99
17	●	**TABLE FOOTBALL** *Rhino*	1.99
18	6	**INVASION** *Bulldog*	1.99
19	●	**DEATH RACE** *Atlantis*	2.99
20	19	**LA SWAT** *Mastertronic*	2.99

Compiled by Gallup/Microscope

Decathlon from Firebird enters the chart this month at No 1, knocking Gauntlet from that position. See the review of Decathlon in this issue of *Atari User*. There is a great deal of movement with eight titles entering the Top 20 – while the majority are budget titles, the full-priced Living Daylights from Domark enters at No 4.

MicroLink

in association with

TELECOM GOLD

NEWSLETTER

Spreading the word

IN the centenary year of the international language Esperanto, a new branch – or Grupo to be exact – has been formed in London, and MicroLink is its chosen electronic route to the rest of the world.

About 52 million people worldwide – 8 million in Europe – speak the amalgam of Anglo-Saxon and Latinate tongues invented in 1887 by Polish doctor Ludovic Zamenhov.

The Sud-Londona Esperanto-Grupo has been going for five months.

Secretary Gregory Porilo said: "We believe the time is ripe for a revival of interest in Esperanto. Not just because of its centenary, but also because it has been accepted as a subject for the new GCSE exams and is now the EEC's official language for basic translation.

"The South London branch of Esperanto is using MicroLink to further spread the word about the benefits of learning the language".

Typesetting over the line

LOW-COST, professional quality typesetting for everything from business cards to magazines is now available electronically on MicroLink.

Wordstream provides a 24-hours-a-day, seven-days-a-week service for companies and individuals who want to control their own printing and save on costs.

All subscribers need do is key in the text on their micro and send it via MicroLink's electronic mail system. It is switched electronically to Wordstream in Bournemouth who typeset the material and return the finished product by first class post or special delivery.

Text for typesetting can be prepared on an ordinary word processor by inserting special codes to specify typefaces, sizes and measures. Then it is transmitted to the Wordstream mailbox on MicroLink.

Special software automatically checks the text file to ensure that codes are correct, and initiates processing immediately. Within 30 minutes a bromide repro for platemaking or camera is produced for despatch to the customer.

The service offers 155 typefaces from 4.5 to 72 point. The range includes expanded, condensed and italic type, variable letterfit, accents and fractions, and paper-saving multi column text.

Payment is by the foot length of repro and Wordstream registration is free on MicroLink.

SPEEDING THE FACTS

NEARLY 30 of Scotland's largest local authorities and six local government trades unions are communicating electronically via MicroLink.

The Scottish Local Government Information Unit was set up two years ago as an information research and publicity service for the organisations.

"We feed facts and figures in easily digestible format to well over 1,000 key elected officials and administrators", said the Unit's director Archie Fairley.

"In addition we are a source of local government information.

"MicroLink telex and electronic mail facilities will help us move all this information a lot faster than before".

Aid to trade

MICROLINK technology is helping improve trade links between Britain and the Third World.

Latest overseas businessman to take advantage of fast, efficient telex and electronic mail facilities is S.S.Wijayasinha.

He is managing director of Bureau-Matic, based in Abidjan, capital of the Ivory Coast, a former French colony in West Africa.

"My company imports computer accessories from various suppliers in the UK, but existing communications are not satisfactory", he said.

"Letters can take up to three weeks to arrive and the telephone service is very erratic.

"I plan to use MicroLink for all my international communications from now on because I know I can depend on its speed and reliability".

New Open University Club

LIKE many of the Open University's 70,000 plus students, electronics engineer Jim Hatton often feels a sense of isolation.

"I can't get to evening classes every week, I have little or no contact with other OU students, and though the instructors are very helpful they are also very busy and I dislike bombarding them with letters and phone calls", he said. Jim's solution – for himself and other part-time students in the same situation – has been to form an Open University Club on MicroLink where people can communicate electronically about their courses.

"At a recent summer school I discovered that a lot of people like me can't get to the tutorials", he said. "But lots of us have micros and modems, so the technology for exchanging ideas and opinions is there to be tapped.

"The Open University has a policy of encouraging self help groups where students can discuss problems and gain a greater understanding of their courses.

"I'm hoping that OU instructors will also log on to the Open University Club on MicroLink so that students can benefit from their input too".

YOUR chance to join MicroLink – turn to Page 4

Play the game of life

A PROGRAMMING assignment often set for would-be computer scientists is to write a program that simulates the evolution of life at cell level.

PHILIP MASSAM's program simulates cellular evolution

The rules are simple: If an empty cell is surrounded by exactly three live cells a birth will occur in it, but if a live cell is surrounded by more than three or fewer than two live ones it dies of overcrowding or loneliness respectively.

The amount of calculation involved to determine the status of a cell makes Basic Life programs very slow, so here is a machine code version which can analyse approximately 1000 cells in less than one second – less time than it takes a Basic version to analyse one cell.

Type in the program as it stands and save it to tape or disc so that you have a backup copy. Then run the program, and if all is well the display will change to two graphics 0 lines sandwiching an area of graphics 12.

Now the program will allow you to set up the initial pattern of cells using the joystick. Move the cursor – shown by the cross – to the required position and to create or erase a cell press the fire button. When the cursor is on a cell, it will be red, otherwise all cells will be green.

If Option is pressed once you've set up the initial pattern the program will switch to single step mode instead of the default continuous generation mode.

Pressing Start will start the life process. All cells born in one generation will be coloured red and all cells surviving from one generation to another will be green. If the single step mode is used each generation will be created when the fire button is pressed.

At any time the Life process can be stopped by pressing Help. The number of generations that the life form has survived is shown at the bottom left of the screen.

As you experiment you'll find many interesting patterns of cells, but to start you off the two figures show well known ones. Figure I gives a pattern that appears to walk across the screen and is known as the glider. Figure II is known as the seed and is best seen in single step mode.

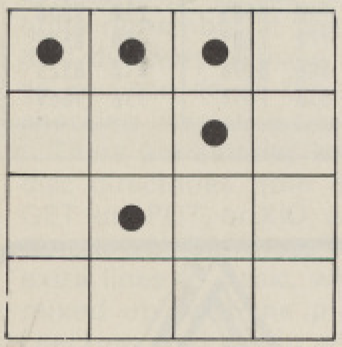


Figure I: The glider

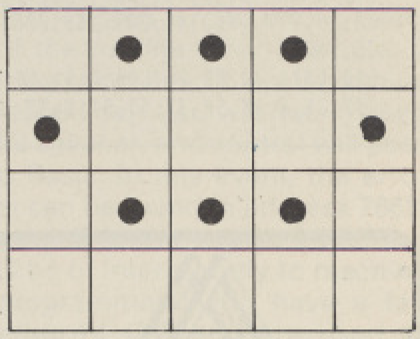


Figure II: The seed

```
10 REM Life by Phil Massam
20 REM (c) ATARI USER
40 GRAPHICS 0
50 ? CHR$(125)
60 ? "          THE GAME OF LIFE"
70 ? :? "             By Phil Massam"
80 ? :? "             Data Loading.."
90 ? :? "             ...Wait a
Mo..":POKE 752,1
92 ? :? :?
95 REM **** Data Load Routine
100 START=20000:INC=0
110 READ DTA:IF DTA=999 THEN 150
115 POKE START,DTA
120 START=START+1:INC=INC+1
125 IF INC=30 THEN ? ".";:INC=0
130 GOTO 110
140 REM **** Call Machine Code
150 A=USR(20000)
160 END
290 REM **** Data for Life
300 DATA 169,25,133,198,169,82,133,199
,169,0,133,185,133,188,133,193,133,194
,133,195
310 DATA 133,196,32,112,79,32,226,79,3
2,250,79,32,13,80,32,0,80,169,0,141
320 DATA 220,2,32,96,79,165,188,240,26
,173,132,2,240,251,160,3,32,236,80,173
330 DATA 220,2,240,3,76,14,79,173,132,
2,208,243,32,0,80,162,0,160,0,132
340 DATA 203,132,204,32,156,79,132,186
,132,187,160,0,177,205,240,2,230,204,1
60,1350 DATA 177,205,240,2,230,204,160
,2,177,205,240,2,230,204,160,40,177,20
5,240,2
360 DATA 230,204,160,42,177,205,240,2,
230,204,160,80,177,205,240,2,230,204,1
60,81
370 DATA 177,205,240,2,230,204,160,82,
177,205,240,2,230,204,134,134,160,41,1
77,205
380 DATA 208,15,165,204,201,3,208,23,1
98,186,169,224,145,207,76,227,78,169,9
6,166
390 DATA 204,224,3,240,243,224,2,240,2
39,198,187,169,0,145,207,166,134,232,2
24,38
400 DATA 208,65,230,203,165,203,201,23
,208,71,32,156,79,165,185,73,255,133,1
85,32
410 DATA 156,79,165,186,5,187,133,187,
240,8,173,220,2,208,3,76,74,78,32,156
420 DATA 79,165,187,240,11,160,1,32,23
6,80,32,22,81,76,32,78,160,0,32,236
430 DATA 80,32,22,81,76,32,78,169,0,13
3,204,169,1,133,209,32,73,79,76,122
440 DATA 78,169,0,133,204,169,3,133,20
9,162,0,32,73,79,76,122,78,24,165,205
450 DATA 101,209,133,205,144,2,230,206
,24,165,207,101,209,133,207,144,2,230,
208,96
460 DATA 248,56,160,3,185,193,0,105,0,
153,193,0,136,208,245,216,162,3,160,6
470 DATA 181,193,41,15,24,105,16,145,1
98,181,193,74,74,74,74,24,105,16,136,1
45
480 DATA 198,136,202,208,231,96,24,165
,191,101,209,133,191,165,192,144,2,230
,192,96
490 DATA 165,185,240,6,32,203,79,76,16
9,79,32,180,79,169,52,141,48,2,169,82
500 DATA 141,49,2,96,169,51,133,205,14
1,56,82,169,88,133,206,141,57,82,169,8
7
510 DATA 133,207,169,82,133,208,96,169
,87,133,205,141,56,82,169,82,133,206,1
41,57
520 DATA 82,169,51,133,207,169,88,133,
208,96,32,156,79,162,4,160,0,169,0,145
530 DATA 205,145,207,200,208,249,230,2
06,230,208,202,208,242,96,160,2,32,236
,80,96
540 DATA 32,156,79,160,39,169,0,145,20
5,136,208,251,96,32,156,79,165,205,133
,191550 DATA 165,206,133,192,162,255,1
60,1,76,74,80,166,189,164,190,72,165,2
03,145,191
560 DATA 104,201,14,208,21,224,0,240,5
7,56,165,191,233,40,133,191,165,192,23
3,0
570 DATA 133,192,202,76,106,80,201,13,
208,15,224,20,240,32,169,40,133,209,32
,142
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Turn to Page 10 ►

◀ *From Page 10*

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580 DATA 79,232,76,106,80,201,7,208,8,
192,38,240,13,200,76,106,80,201,11 ,208
590 DATA 5,192,1,240,1,136,134,189,132
,190,24,177,191,133,203,208,5,169,11,7
6
600 DATA 124,80,73,128,145,191,162,120
,160,0,200,208,253,202,208,248,173,120
,2,201
610 DATA 15,208,144,173,31,208,201,3,2
08,3,32,196,80,173,31,208,201,6,208,5
620 DATA 165,203,145,191,96,166,189,16
4,190,173,132,2,208,218,165,203,240,4,
169,0
630 DATA 240,2,169,96,133,203,145,191,
173,132,2,240,251,76,106,80,165,188,24
0,11640 DATA 169,0,133,188,160,5,32,23
6,80,240,9,169,1,133,188,160,4,32,236,
80
650 DATA 160,250,162,255,202,234,234,2
08,251,136,208,246,32,250,79,96,32,156
,79,169
660 DATA 28,133,186,169,81,133,187,192
,0,240,17,24,165,186,105,40,133,186,16
5,187
670 DATA 105,0,133,187,136,76,247,80,1
60,39,177,186,145,205,136,208,249,96,1
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680 DATA 2,208,251,96,0,51,52,33,34,44
,37,26,0,48,50,37,51,51,0,38
690 DATA 41,50,37,0,34,53,52,52,47,46,
0,38,47,50,0,50,37,51,52,33
700 DATA 50,52,0,0,0,53,51,37,50,0,34,
50,37,33,43,26,0,38,41,50
710 DATA 37,0,34,53,52,52,47,46,0,38,4
7,50,0,50,37,51,52,33,50,52
720 DATA 0,0,0,0,0,51,37,52,0,53,48,0,
41,46,41,52,41,33,44,0
730 DATA 48,33,52,52,37,50,46,26,0,48,
50,37,51,51,0,51,52,33,50,52
740 DATA 0,0,0,0,0,48,50,37,51,51,0,38
,41,50,37,0,34,53,52,52
750 DATA 47,46,0,38,47,50,0,46,37,56,5
2,0,39,37,46,37,50,33,52,41
760 DATA 47,46,0,0,0,46,47,55,0,47,46,
0,51,41,46,39,44,37,0,51
770 DATA 52,37,48,0,45,47,36,37,0,0,0,
0,0,0,0,0,0,0,0,0
780 DATA 0,0,0,0,0,46,47,55,0,47,46,0,
35,47,46,52,41,46,53,47
790 DATA 53,51,0,45,47,36,37,0,0,0,0,0
,0,0,0,0,0,0,0,0
800 DATA 0,0,0,0,0,39,37,46,37,50,33,5
2,41,47,46,26,0,0,0,0
810 DATA 0,0,0,0,0,0,0,0,0,168,165,172
,176,0,52,47,0,33,34,47
820 DATA 50,52,14,0,112,112,112,66,205
,206,4,4,4,4,4,4,4,4,4,4
830 DATA 4,4,4,4,4,4,4,4,4,4,4,4,4,66,
12,82,65,52,82,0
930 DATA 999
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	5585	20	3383	40	2039
50	1737	60	4724	70	6219
80	5786	90	7259	92	1266
95	5714	100	3241	110	5408
115	3231	120	4677	125	4763
130	1611	140	5670	150	2111
160	836	290	4395	300	12346
310	10655	320	10844	330	10080
340	11425	350	11293	360	11523
370	11803	380	11800	390	11688
400	11716	410	10901	420	10575
430	10734	440	10747	450	11770
460	10700	470	11394	480	12118
490	10869	500	11139	510	11792
520	10957	530	11879	540	11560
550	11926	560	11293	570	11446
580	10879	590	11105	600	11775
610	10738	620	11677	630	11520
640	10746	650	12188	660	11829
670	12013	680	9374	690	9238
700	9030	710	9209	720	8368
730	9408	740	8605	750	9250
760	8871	770	7605	780	8613
790	7472	800	8296	810	8525
820	8774	830	7619	930	1569

Put the boot in

Obtain direct access to disc directories with this program by LEN GOLDING

IF you've had your disc drive for more than a few months, you will know all about the joys of weeding. You load up Dos, read the directory to see if there are any old files you can get rid of, and discover that the names which seemed so appropriate when you invented them have lost all semblance of meaning.

What did WEENIES.BAS do? And do you still need it? To be on the safe side you return to Basic, try to Load the file and discover you've forgotten the exact spelling.

So it's in and out of Dos again to get the correct file name, load the program, list or run it and make your decision. Then back to Dos to erase it if necessary, and refresh your memory about other files on the disc.

This little autoboot program makes life much easier, whether you're on a weeding expedition or just attempting to find a file whose name you can't quite remember. It lets you read the disc directory without leaving Basic, so you can do all the searching and checking in relative comfort.

There are simpler ways of reading disc directories from Basic – OPEN, GET and PUT, or XIO, can be made to do the job. But these involve writing extra lines of Basic, which could get mixed up with the program you're checking, and will in any case be lost when you load anything new.

This machine code routine loads automatically at power-up time into a safe area of memory which cannot overlap into a Basic program, and is pretty well immune to anything Basic can do.

Once installed, it stays in place until you turn power off or enter Dos, and you can forget it's there until you need it. Then a simple direct mode USR call will print the directory and return to Basic as though nothing had happened.

Program I is the listing to type in. As with all machine code programs, it's essential to type in the DATA statements exactly as they appear, or the system will probably lock up. And be sure to save a copy before you try running it for the first time.

Insert a disc that contains a copy of DOS.SYS, and make sure it doesn't also contain an AUTORUN.SYS file which you want to keep. Then run Program I, and the new AUTORUN.SYS file will be created for you automatically.

It needs to be loaded into memory before you can use it, and this is done simply by turning power off then on again.

Once the machine code is installed you can list the directory on screen with the command:

X=USR(7650)

Alternatively you can send it to a printer by:

X=USR(7650,1)

If anything goes wrong during execution of the routine – for example, if the printer is off-line or the disc drive not switched on – you will hear a beep from the speaker, and control will pass back to Basic. In this event, the error number can be found in address 7662.

Program II is the source code, but this will be of interest only to machine code programmers who have a fair knowledge of CIO and are used to working with assembly language.

Program I: Basic program

```
10 OPEN #1,8,0,"D:AUTORUN.SYS"
20 READ D:IF D=-1 THEN END
30 PUT #1,D:GOTO 20
40 DATA 255,255,2,29,237,29
50 DATA 165,12,141,24,29,165,13,141,25
,29,169,23,133,12,169,29,133,13,76,26
60 DATA 29,32,36,29,169,4,141,231,2,16
9,30,141,232,2,96,104,141,239,29,240
70 DATA 47,104,104,162,32,142,239,29,3
2,229,29,162,32,169,3,157,66,3,169,88
80 DATA 157,68,3,169,29,157,69,3,169,8
,157,74,3,169,0,157,75,3,32,86
90 DATA 228,16,5,76,204,29,80,58,162,1
6,32,229,29,162,16,169,3,157,66,3
100 DATA 169,130,157,68,3,169,29,157,6
9,3,169,6,157,74,3,169,0,157,75,3
110 DATA 32,86,228,16,8,76,204,29,68,5
8,42,46,42,162,16,172,239,29,169,5
120 DATA 157,66,3,169,9,153,66,3,169,2
40,157,68,3,153,68,3,169,29,157,69
130 DATA 3,153,69,3,162,16,172,239,29,
169,20,157,72,3,153,72,3,169,0,157
140 DATA 73,3,153,73,3,32,86,228,48,8,
174,239,29,32,86,228,16,222,192,136
150 DATA 240,8,140,238,29,169,158,141,
252,2,162,16,32,229,29,174,239,29,240,
3
160 DATA 32,229,29,96,76,37,29,169,12,
157,66,3,32,86,228,96,224,2,225,2,2,29
,-1
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	5165	20	4681	30	2873
40	4007	50	10934	60	10746
70	11009	80	10105	90	10410
100	10241	110	10547	120	10493
130	10422	140	10742	150	11176
160	11468				

Program II: Source code of Program I

```
  10 CH=$2FC
  20 CIOV=$E456
  30 CLOSE=$0C
  40 DOSINI=$0C
  50 EOD=$88
  60 GETREC=$05
  70 ICAUX1=$34A
  80 ICAUX2=$34B
  90 ICBAL=$344
0100 ICBLL=$348
0110 ICCOM=$342
0120 MEMLO=$2E7
0130 OPDIR=$06
0140 OPEN=$03
0150 PUTREC=$09
0160 WRITE=$08
0170  *=$1D02
0180 COLDST
0190  LDA DOSINI     Trap SYSTEM RESET
0200  STA WARMST+1
0210  LDA DOSINI+1
0220  STA WARMST+2
0230  LDA #WARMST&255
0240  STA DOSINI
0250  LDA #WARMST/256
0260  STA DOSINI+1
0270  JMP WMST2
0280 WARMST
0290  JSR INITDOS
0300 WMST2
0310  LDA #FINISH&255    Reset MEMLO
0320  STA MEMLO
0330  LDA #FINISH/256
0340  STA MEMLO+1
0350 INITDOS
0360  RTS
0370 ;The USR routine starts here.
0380 USRCALL
0390  PLA
0400 -STA FLAG
0410  BEQ SETDIR     Branch if no
                     parameter
0420  PLA            Discard parameter
```

Turn to Page 12 ▶

◄ From Page 11

```
0430  PLA
0440  LDX #32        '32' is used to
0450  STX FLAG       select channel #2
0460  JSR CLOSEIT    Close #2
0470  LDX #32
0480  LDA #OPEN      then Open it again
0490  STA ICCOM,X    for the printer
0500  LDA #PRNAME&255
0510  STA ICBAL,X
0520  LDA #PRNAME/256
0530  STA ICBAL+1,X
0540  LDA #WRITE
0550  STA ICAUX1,X
0560  LDA #0
0570  STA ICAUX2,X
0580  JSR CIOV
0590  BPL SETDIR
0600  JMP ERROR
0610 PRNAME .BYTE "P:"
0620 SETDIR
0630  LDX #16
0640  JSR CLOSEIT    Close #1
0650  LDX #16
0660  LDA #OPEN      then Open it again
0670  STA ICCOM,X    to read directory
0680  LDA #DNAME&255
0690  STA ICBAL,X
0700  LDA #DNAME/256
0710  STA ICBAL+1,X
0720  LDA #OPDIR
0730  STA ICAUX1,X
0740  LDA #0
0750  STA ICAUX2,X
0760  JSR CIOV
0770  BPL SETREC
0780  JMP ERROR
0790 DNAME .BYTE "D:*.*"
0800 SETREC
0810  LDX #16        Set #1 to read the
0820  LDY FLAG       directory records
0830  LDA #GETREC    and set either
0840  STA ICCOM,X    #0 (screen) or
0850  LDA #PUTREC    #2 (printer)
0860  STA ICCOM,Y    to print them
0870  LDA #DBUFF&255
0880  STA ICBAL,X
0890  STA ICBAL,Y
0900  LDA #DBUFF/256
```

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```
0910  STA ICBAL+1,X
0920  STA ICBAL+1,Y
0930 NEXTREC
0940  LDX #16
0950  LDY FLAG
0960  LDA #20
0970  STA ICBLL,X
0980  STA ICBLL,Y
0990  LDA #0
1000  STA ICBLL+1,X
1010  STA ICBLL+1,Y
1020  JSR CIOV       Get a record
1030  BMI ENDTST     Branch on error
1040  LDX FLAG
1050  JSR CIOV       Print the record
1060  BPL NEXTREC
1070 ENDTST
1080  CPY #EOD       End of directory?
1090  BEQ CLEANUP    Branch if so
1100 ERROR
1110  STY ERHOLD     Store error type
1120  LDA #158       sound buzzer
1130  STA CH
1140 CLEANUP
1150  LDX #16        Close #1
1160  JSR CLOSEIT
1170  LDX FLAG
1180  BEQ EXIT
1190  JSR CLOSEIT    and #2 if necessary
1200 EXIT
1210  RTS            Return to Basic
1220  JMP USRCALL    Gives convenient
                     address
1230 CLOSEIT
1240  LDA #CLOSE     Close the channel
1250  STA ICCOM,X    whose number *16 is
1260  JSR CIOV       in the X register
1270  RTS
1280 ERHOLD *=*+1
1290 FLAG *=*+1
1300 DBUFF *=*+20
1310 FINISH
1320  *=$2E0
1330  .WORD COLDST
```

It's a real steal!

Program: Guild of Thieves
Price: £19.95
Supplier: Rainbird Software, First Floor, 74 New Oxford Street, London WC1A 1PS.
Tel: 01-631 3589

TO nick this or to nick that, that is the question. Well, it is if you want to join the notorious Guild of Thieves because, make no mistake about it, thievery is what this adventure is all about.

In this excellent follow-up to Rainbird's The Pawn, you have applied to join the Guild and must qualify for membership by proving you have the necessary knocking-off skills.

Cast away on an island (in Kerovnia, naturally), you have been tasked with stealing every bit of treasure you can lay your light fingers on.

The game starts in a boat near to a jetty. Nearby, the head of the Guild, the Master Thief, beckons you to jump ashore and begin ransacking the island.

When you disembark, the Master Thief disappears, but that's not the last you'll see of him. Throughout the game, he reappears briefly at the most unlikely moments, adding an extra bit of spice and fun to your escapades.

Your first step is to get out of the boat and on to the jetty. And because the parser seems a bit unhappy with this opening, leaving the boat isn't as straightforward as it should be.

But it doesn't really matter – failure to leave the boat fairly promptly causes the Master Thief to lose patience and drag you bodily from the boat anyway.

Generally speaking, the parser is very good at handling your commands. What is odd is that it seems better at handling really complex input than some of the simpler commands.

For example, EXAMINE ALL (very useful) describes all the objects in a single location but not those which are inside another object, even though they are clearly visible.

Two commands that really make progress much easier are GO TO a place and FIND an object. Provided you have already visited it, GO TO will take you directly to the location specified taking you through any intermediate locations on the way without halting (unless there is something that physically prevents you from going on).

The FIND command similarly takes you straight to the location of a previously discovered object – so handy if you have been littering the island with items and failed to take a note of where each was last left.

There are plenty of locations to explore on the island, not least of which is an imposing mansion. Getting inside calls for some suppression of your natural thieving tendencies – who said chivalry was dead?

The mansion is large and there are many unusual objects to discover and locations to search.

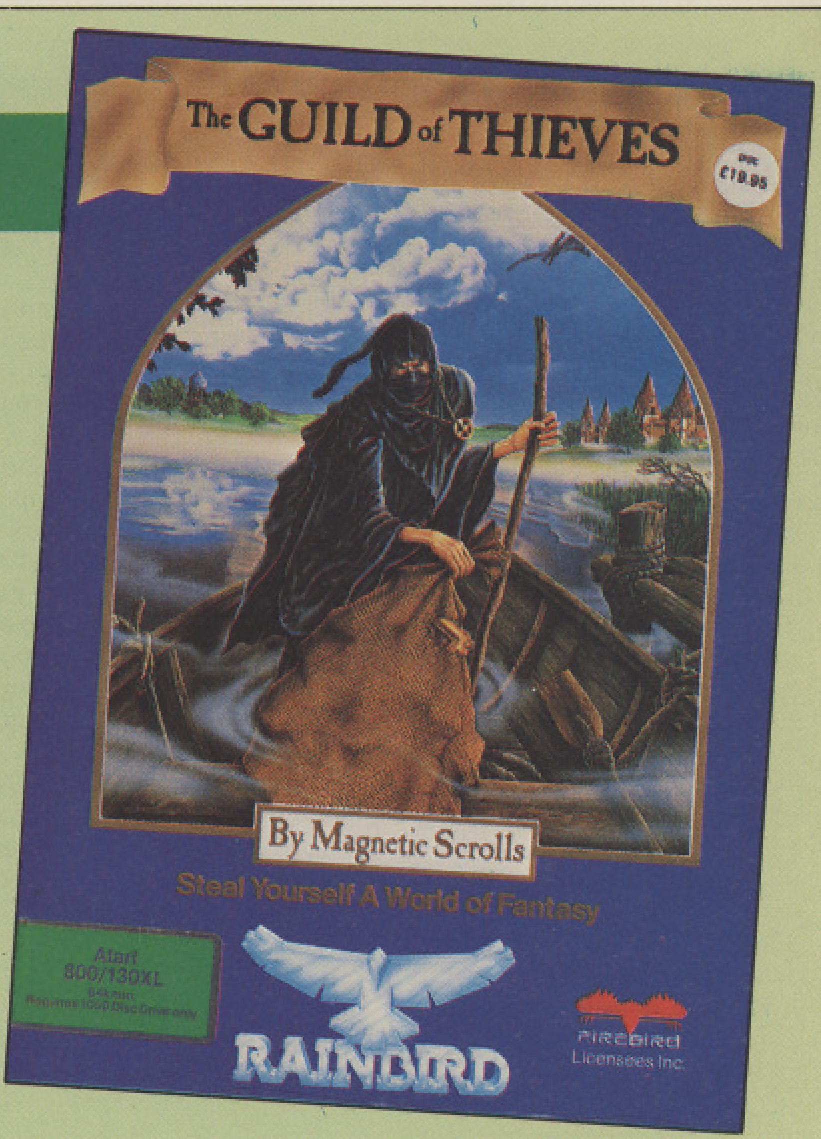
You have to be careful what and how you smuggle items out of the mansion – the Gatekeeper is always on the alert.

He is also a gambling man and will offer you the chance to bet on a real rat race. Don't pass up or be late for the opportunity when it arrives – you could do with the winnings.

Some of the puzzles you'll find here include a bear guarding a chalice, a rat-infested cellar and a secret laboratory.

Make sure you visit the loo and stay a while there, if only to see one of the sudden and humorous appearances of the Master Thief.

Outside the mansion,



you'll come across a cave entrance leading to an underground complex. Again puzzles abound and you'll need to learn, for example, how to cross a room of hot coals, how to get a macaw to speak and how to deal with a venomous spider.

The Bank of Kerovnia is nearby but always seems to be closed. You should eventually discover how to demonstrate that there are still signs of life within (a nice touch, this) but it will take some time to make the bank fully open up to you.

Make sure you visit the cemetery, not only for the picture accompanying the text but also to have a look at the three graves you'll find there. Bet you didn't know that this is where they ended up!

And speaking of pictures, the 29 scene-setting illustrations built into the game are well up to Pawn standard. One or two are a little on the predictable side and add little to the atmosphere, but most are good and some quite outstanding.

Guild of Thieves comes on two discs with a die, a Kerovnian credit card, a Guild contract of service and a copy of What Burglar magazine.

The latter serves as a guide to the game and will give you a few hints and belly-laughs into the bargain. The game needs a minimum of 64k to run it.

I much preferred Guild of Thieves to The Pawn. For one thing it is much more logical, for another it hangs together in atmosphere and detail so much better.

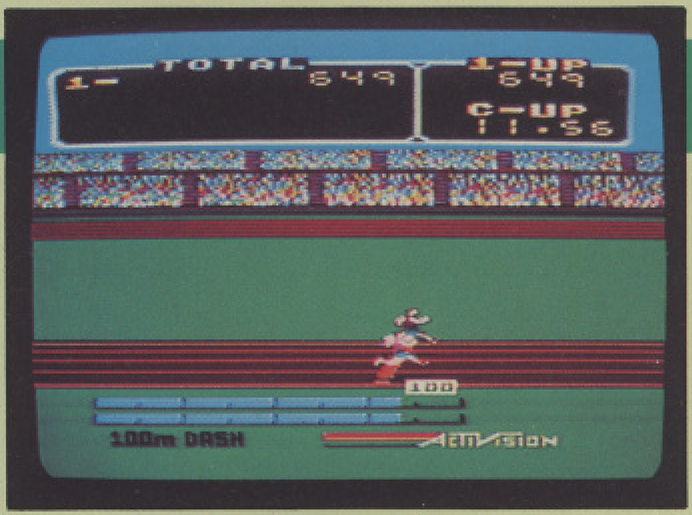
The puzzles range in difficulty from easy to mind-bending so there is plenty here for all adventuring skills.

This is an absorbing, funny and tantalising adventure and guaranteed to be another sure-fire winner for Rainbird. Don't delay – buy it. The Master Thief awaits you.

Bob Chappell

Presentation	9
Atmosphere	9
Puzzlement	9
Value for money	9
Overall	9

Mash a joystick



Program: Decathalon
Price: £1.99
Supplier: Firebird, 64-76 New Oxford Street, London WC1A 1PS.
Tel: 01-379 6982

HOW many times have you wanted to be Daley Thompson when he steps up to receive his gold medal? Here is your chance.

The first screen presents you with two men racing down a track, an unimpressive piece of music and a message scrolling down the screen telling you that it's not the winning that's important but the taking part. I would prefer a little gold medal to make me feel better.

You are offered the option of up to four competitors and in the track events two people may race against each other.

After choosing the number of players and entering your initials, you can choose from ten events in a scrolling window.

The events – 100, 400, and 1500 metres, long jump, high jump, shot putt, discus, javelin, pole vault and 110 metre hurdles – are all in their own way nice to play but I found the 400 and 1500 metre events a little tough on the hand as you try to pull your joystick apart.

Your time and distance are displayed as a digital clock. I made a 88 metre throw and the javelin moved a very short distance and the clock whizzed up far too fast.

If this had been slowed down and the javelin allowed to hang in the air longer the event would have had more atmosphere.

The graphics are reasonable but with poor sound, though the animation is quite well done. You can choose which event you want to play and not have to follow a set order of events and this is a saving grace.

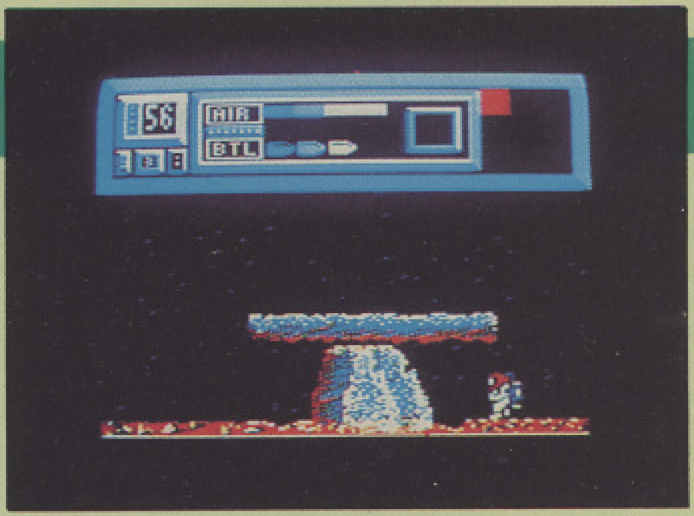
The pole vault is let down by poor animation but as a budget game the good points far exceed the bad.

The major drawback is the fact that it is one of those games where you have to rattle the joystick from left to right in a mad fashion to get the little man to run his socks off. So if you don't mind the risk of ruining your joystick you're all right to buy this one.

Neil Fawcett

Sound	*5*
Graphics	*6*
Playability	*6*
Value for money	*7*
Overall	*7*

Bargain time



Program: Universal Hero
Price: £1.99 (cassette)
Supplier: Mastertronic, 5-10 Paul Street, London EC2A 4JH.
Tel: 01-377 6880

ALL I found out about Universal Hero in the blurb was that it's an arcade adventure. But there are no clues and instructions are minimal. Still, some people like to go into their adventures blind.

Our hero has a pretty everyday sort of chore to carry out, by Superhero standards anyway – to save the planet from imminent destruction.

The culprit is an out of control space freighter which must be repaired to avert disaster.

No real problems – but for the fact that the nearest intergalactic Halfords is on a neighbouring planet and the interplanetary shuttle is itself in need of a 5,000 mile service and MOT.

To make things interesting, the freighter is due to smack into terra firma in one hour's time.

So the race is on to find the parts to the shuttle and work out what to do with them. Then to whiz off to find the parts for the freighter and fix it.

In your quest only nine objects can be held and displayed at any one time. Movement is via a jet pack, hindered by occasional aliens of varying degrees of ferocity, force fields and other obstacles.

Contact with the aliens may eat away at your air supply or kill you outright. Your powers of logic and deduction will get you through otherwise impassable barriers.

The game is nicely presented, with good graphics and movement. Use of sound is minimal, which is at least preferable to bad use of sound. I thought the game was immensely playable and addictive.

On reaching a control computer within the caves under the planet surface, and having in my possession all the items necessary to work it, I logged on and was asked to identify myself.

At this point my keyboard locked up and I could do nothing but reset the machine and restart the game. This happened every time and meant that I could not progress further.

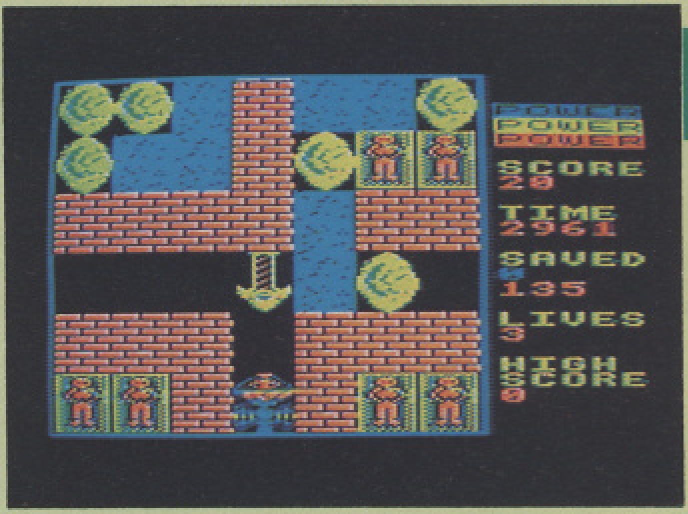
I mentioned this to Mastertronic, who said that they had not come across the problem before, the suggestion being that perhaps I had a dud copy.

This reservation apart, I really enjoyed Universal Hero – well as far as I got, anyway. Full marks to Mastertronic for putting out a great game at under £2 – it's a lot of entertainment for the price and puts many more expensive games to shame.

Niels Reynolds

Sound	*6*
Graphics	*8*
Playability	*10*
Value for money	*10*
Overall	*9*

Triple trouble



Program: Survivors
Price: £2.99
Supplier: Atlantis, 28 Station Road, London SE25 5AG.
Tel: 01-771 8642

MAZE games are usually complicated enough when you have to concentrate on moving one person around. Here you have the unfortunate problem of having to manoeuvre three droids, each with its own ability.

Together you must rescue almost 1000 survivors scattered around seven levels in a hibernation dome damaged in a nuclear war. This is achieved by teleporting them to safety once you find them.

Your three droids have their own characteristics: The number one droid looks like two rows of teeth on a pole and is used to eat the earth to reach the survivors.

Number two droid looks like an abnormal corkscrew and this is your teleport droid.

Droid three looks like a cross between Hercules and a Chieftain tank and is used to move some of the many boulders scattered around the dome.

To succeed you must move all of the droids around the maze together (but only one at a time) as only their combined abilities can save the day. But don't keep losing them as I did.

Droids have individual energy levels, if reduced to zero then you lose one of your three lives.

Energy can be lost by contact with one of the MK.1 Guardian droids that constantly patrol the dome.

Unfortunately their logic circuits have been fried by the radiation and they will attempt to destroy you on sight. Also beware of boulders.

Another problem is getting one of your droids trapped by falling boulders. If this happens then you simply hit Escape and forfeit a life. Boulders can also be used to trap or crush Guardian droids. Add to this a time limit, and this rescue has plenty of problems.

Be very careful in what moves you choose as a mistake can make you pay very dearly. Try to keep all your droids together and don't disturb too many boulders if you can help it.

The graphics are quite nice but the sound effects are sadly lacking, the scrolling is quite well done and adequate for the job at hand.

If you are a fan of Boulderdash you will enjoy this.

Neil Fawcett.

Sound	*4*
Graphics	*7*
Playability	*8*
Value for money	*8*
Overall	*8*

Aztec romp



Program: Aztec Challenge
Price: £1.99 (cassette)
Supplier: Top Ten Software, Chiltern Enterprise Centre, Station Road, Theale, Berkshire RG7 4AA.
Tel: 0734 303663

THE Aztec gods have demanded a sacrifice. They inform you that you are among the chosen victims.

There is, however, an opportunity to escape by undergoing a series of physical trials, pushing you to the limits of your agility and stamina.

It appears that the Aztec race has, over the centuries, developed running and jumping abilities that make Daley Thompson look like a seven stone wimp – and you are going to need to coordinate those abilities to survive.

I must say that on starting Aztec Challenge, I was unimpressed. However, the more I played the game the more it grew on me. Although easy to play, it proved rather more difficult to complete successfully.

The concept is simple. You must run and jump your way through 99 levels of obstacles, which become progressively more difficult.

You run continuously with no control over your speed, which is pre-set. The only control you do have is in choosing which of the three heights you are going to jump. But as you have no time to stop and consider a jump you must live by your reflexes.

There is an option for two players with both runners appearing on the screen simultaneously. In this case I found that the runner behind has a slight advantage, being able to benefit from the mistakes of the first.

Another pleasing option is that, when all your lives have been used, you can choose to restart the game at the beginning or where you finished.

The graphics are not unreasonable for a budget game and as screen shots are printed on the packaging you are able to form a realistic impression of the game. There is very little use of sound.

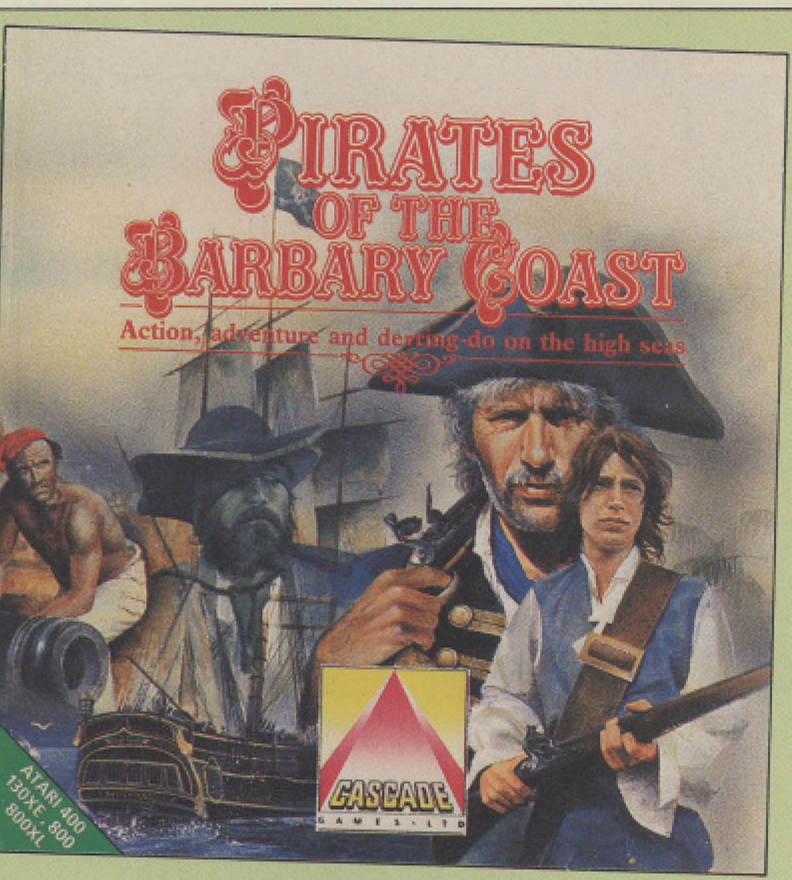
Aztec Challenge's appeal lies in its uncomplicated nature. The simplicity of controls and the gentle lead into the game make it particularly suitable for children, while the higher levels should keep more experienced players busy for a good while.

I don't suppose it will go down as an all time classic, but I rather enjoyed it and feel it is well worth the money.

Niels Reynolds

Sound	*6*
Graphics	*6*
Playability	*8*
Value for money	*8*
Overall	*7*

Passive piracy



Program: Pirates of the Barbary Coast
Price: £9.95 (disc)
Supplier: Cascade Games, 1-3 Haywra Crescent, Harrogate HG1 5BG.
Tel: 0423 525325

IN contrast to the impressive packaging artwork, this game turns out to be very dull indeed. The idea behind it is good, if not entirely original, but sadly the implementation is lacklustre.

What we have here is basically a trading game combined with some elements of arcade action, luck and strategy.

You are captain of the US trading frigate American Star which has been raided by the notorious Bloodthroat the pirate.

(Rule one of pirate tales is always to give the villain a brutish name – it would never do to have the wicked pirate called Primrose or Buttercup, for example).

Bloodthroat has your daughter and is demanding a huge ransom, to be paid within 30 days or else. You must sail the Barbary Coast, trading and fighting, in order to raise the necessary readies.

The game sets sail with a beeping, nautical tune and switches to the main screen, a map of the Barbary Coast. Moving a rather stiff and sluggish pointer, you place it on one of the several destinations you wish to sail to.

The disc drive then whirrs away for a not inconsiderable period and eventually the next scene appears, a view from behind one of the cannons on your ship at sea.

There are a number of cannons and you can move along the deck – the picture simply slides to the left or right to reveal an identical scene.

A pirate ship may come sailing slowly past and you can engage it in battle or not.

Cannons are your only weapon and must first be loaded before they can be fired.

All or any of the cannons can be loaded in one operation, and while the procedure attempts to be technically realistic, I suppose, it is also a tedious and frustrating business.

It goes like this: Select load, select the numbers of the cannons to be loaded, move to any working cannon, point at powder, point at cannon, point at push rod, point at cannon, point at cannon ball, point at cannon, point at brush and finally (yawn) point at cannon again. Get any of this wrong and you must start all over again.

One of the pains of the cannon loading sequence is that having loaded every blooming one while at sea, someone unloads them again whenever you dock, so you have to go through the whole rigmarole every time you sail.

To fire any loaded cannon, you point at the fuse whereupon it will start to burn down. The ball will then be ejected with a feeble explosion ("Stap me, bos'n, they be firing at us with cap guns and tennis balls!").

The elevation of the gun can be altered and is necessary because the pirate ships sail past at different distances.

If you hit an enemy ship hard and long enough, you may board her and either claim the booty or read her log, but not both. Stirring stuff, eh?

Hits on your ship are shown by any number of your cannons going up in flames and thereafter becoming inoperable.

When you reach a destination, the disc again whirrs and finally you will be told if there is anything at your chosen spot.

If there's nothing, the message "Captain, there be nothing here. Wish ye to set sail?" appears with the rather pointless single-choice answer "Aye".

In other words, there's no option but to sail to somewhere else. Long disc whirr and it's map time again. Dullsville.

If there is something there, you are shown a treasure map and must pick one of several crosses. With luck, you may find treasure, otherwise, it's sailing time once more.

By now your adrenalin and grey matter will have decided they won't be neeeded on this voyage and have gone down to the pub. You may be tempted to join them, for there's not much more to this game.

Should you land at a port on the coast you are given an opportunity, in a very simplistic way, to buy or sell food and goods, hire men, acquire cannonballs, make repairs and bribe the port officer (in return for a hint).

And really there is very little more to it than that. The game plays exceedingly slowly and is unredeemed by graphics (they are not bad but there are so few scenes), sound (crude) or content.

I don't enjoy having to put down a game by a new company, but I am afraid Cascade Games is going to have to do much better than this if it is to succeed.

Bob Chappell



Sound	*3*
Graphics	*4*
Playability	*3*
Value for money	*3*
Overall	*3*

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5 LINERS

PAINT PICTURE LOADER
from E.M. Liddell

MOST Atari disc drives come complete with a graphics package called Paint. This five-line program allows you to load Paint picture files from Basic. The program works by loading the first five bytes of the file which hold the information for the colour registers and poking the colour registers with them. It then ignores the next 12 bytes and loads the next 3200 bytes which are the actual screen data.

You must remember that to load your own picture the filename within the program must be changed to the same as your picture filename. The program can easily be converted to create a running slide show of pictures.

PROGRAM VARIABLES

COL: Holds the information for the colour registers.
A: Holds all information for the screen registers to form picture.
DUMMY: Used to skip the twelve bytes not used.

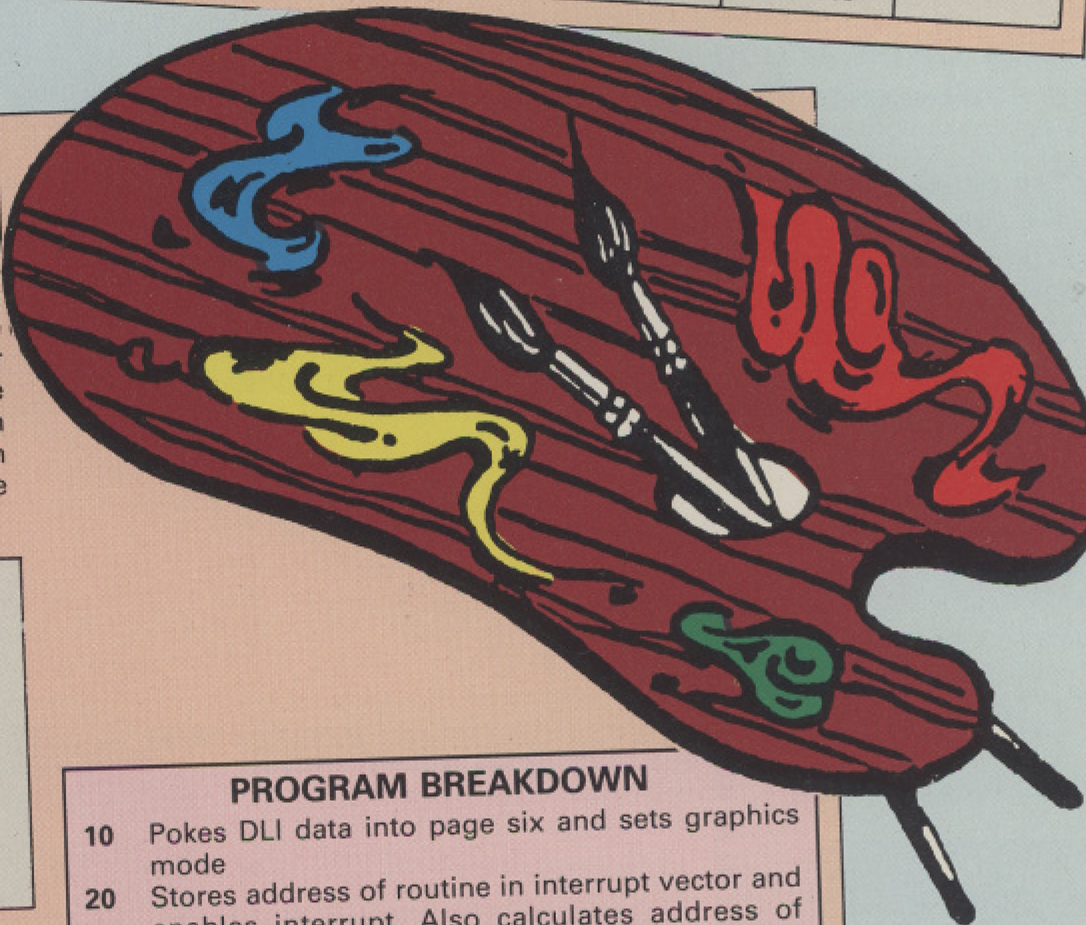
PROGRAM BREAKDOWN

Line 1: Set graphics mode.
Line 2: Finds start of screen and opens channel to disc drive.
Line 3: Gets colour data and pokes colour registers.
Line 4: Ignore next twelve bytes.
Line 5: Loads and displays picture and then closes channel to disc drive.

```
1 GRAPHICS 7+16
2 SCREEN=PEEK(88)+PEEK(89)*256:OPEN #1
,4,0,"D:PICTURE.PIC"
3 GET #1,COL:POKE 712,COL:GET #1,COL:P
OKE 708,COL:GET #1,COL:POKE 709,COL:GE
T #1,COL:POKE 710,COL
4 FOR I=0 TO 11:GET #1,DUMMY:NEXT I
5 FOR I=0 TO 3199:GET #1,A:POKE SCREEN
+I,A:NEXT I:CLOSE #1:OPEN #2,4,0,"K:":
GET #2,KEY:CLOSE #2
```

Get it right!

LINE CHSUM	LINE CHSUM	LINE CHSUM
1 2495	2 10316	3 17451
4 6120	5 17062	



EXTRA COLOURS
from Malcolm Knight

THIS short routine uses a DLI (Display List Interrupt) to enable you to have eight different colours in Graphics 1 or Graphics 2 modes. This allows title screens and so on to become much more interesting with this new option of extra colours which can easily be altered to suit individual tastes.

```
20 FOR Z=0 TO 25:READ A:POKE 1536+Z,A:
NEXT Z:GRAPHICS 17
25 POKE 512,0:POKE 513,6:POKE 54286,19
2:ADD=PEEK(560)+PEEK(561)*256:POKE ADD
+8,PEEK(ADD+8)+128
30 DATA 72,169,18,141,22,208,169,36,14
1,23,208,169,52,141,24,208,169,66,141,
25,208,141,10,212,104,64
40 ? #6;"AAABBBcccddd":POSITION 0,8:?
#6;"AAABBBcccddd"
50 GOTO 50
```

Get it right!

LINE CHSUM	LINE CHSUM	LINE CHSUM
20 10068	25 16233	30 14643
40 14706	50 1424	

PROGRAM BREAKDOWN

10 Pokes DLI data into page six and sets graphics mode
20 Stores address of routine in interrupt vector and enables interrupt. Also calculates address of GR.1 display list. The addition of 8 to POKE ADD+8, PEEK(ADD+8)+128 determines which screen line the interrupt is called on. The addition of 128 in PEEK(ADR+8) calls the routine
30 Holds the data. Each number after the 169 is a colour value
40 Example text printed in Graphics 1
50 Closed loop

IF you've written any useful or interesting five line programs why not send them to us to grace our pages?

We pay £25 for each one published.

You should give a full description of the routine and any other details that are relevant. And remember if you want your material returning please enclose a suitably stamped package.

Win £25

Simply send a copy of the program on disc or tape together with the documentation – preferably as a word processed file – to:

Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport, SK7 5NY.



CURSOR OPTIONS
from Darren Broome

THIS program sets up a VBI (Vertical Blank Interrupt) to scan both the joystick port 1 and the function keys to give you some options for the cursor. If Start is pressed the cursor will be turned off. If both the Select and Start keys are pressed together then the cursor click is turned off.

If Option is pressed both the cursor and the cursor click will be turned on. Also the cursor can be moved around the screen with the joystick plugged into port 1 to allow you fast and comfortable movement of the cursor.

The program stores machine code data in page 6 of memory, so once you have typed the program in save it before you run it as it may crash if you make a typing error.

To execute the program you call it by using the command X=USR(1536).

```
10 FOR P=1536 TO 1686:READ A:POKE P,A:
NEXT P:DATA 104,162,6,160,11,169,6,32,
92,228,96,76,85,6,173,120,2,201,14
20 DATA 240,19,201,13,240,23,201,7,240
,35,201,11,240,23,201,15,240,35,76,95,
228,169,142,141,252,2,76,37,6,169,143
30 DATA 141,252,2,76,37,6,169,134,141,
252,2,76,37,6,169,135,141,252,2,76,37,
6,169,85,141,12,6,169,6,141,13,6,76,37
40 DATA 6,24,173,31,208,201,6,240,18,2
01,4,240,22,201,3,240,26,173,120,2,73,
15,208,30,76,95,228,169,1,141,240,2,76
50 DATA 108,6,169,1,141,219,2,76,108,6
,169,0,141,240,2,141,219,2,76,108,6,16
9,14,141,12,6,169,6,141,13,6,76,108,6
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	17630	20	16465	30	16727
40	16510	50	16781		

QUASI
from Robin Edwards

THIS game shows what you can get into five lines if you really try. Here we have Quasimodo standing on the battlements with the royal guards climbing up to get him. What is poor old Quasi going to do? Simple, he thinks, throw some rocks down to knock them off.

You move Quasi left and right via the joystick plugged into port 1 and by moving it down you will throw a rock at a guard. The game ends when one of two things happens – a guard reaches the top or poor old Quasi loses his footing and falls off the battlement.

As your score goes up the guards get faster and the challenge is to see how many of them you can get before they get you. When typing in line 30 you must abbreviate all POSITION statements as POS. and miss out all spaces. Due to the lengh of certain lines it is not possible to supply a Get it Right! for this program.

PROGRAM BREAKDOWN

- **10** Draw battlements, set variables
- **20** Routine to set up guards
- **30** Draw and move player and guard
- **40** Drop rock
- **50** Game over routine

TYPING-IN NOTES

- **10** Type in as it appears.
- **20** Type in as it appears.
- **30** Abbreviate all POSITIONS to POS. and miss out all spaces.
- **40** Type in as it appears.
- **50** Type in as it appears.

```
10 GRAPHICS 0:POKE 752,1:FOR T=6 TO 20
:POSITION 5,T:? "██████████████████████
█████":NEXT T:X=10:C=0.25
20 A=10:B=INT(RND(0)*25)+5:C=C+0.01
30 S=STICK(0):X=X+(S=7)-(S=11):POSITIO
N X-1,4:? " o ":POSITION X-1,5:? " X "
:POSITION B,A:? "█":POSITION B,A+1:? "
█":POSITION B,A+2:? "█"
40 IF S=13 THEN FOR T=7 TO 20:POSITION
 X,T:? "█":POSITION X,T-1:? "█":NEXT T
:IF X=B THEN Z=Z+1:GOTO 20
50 POSITION 0,0:? "SCORE:";Z:A=A-C:ON
(A>5 AND X>4 AND X<31) GOTO 30:FOR T=0
 TO 255:SOUND 0,T,10,10:NEXT T:RUN
```

An ideal companion

PETER DAVIDSON puts Panasonic's KX-P1081 printer through its paces

THE Panasonic KX-P1081 is a bi-directional dot matrix printer that is friction or tractor feed and has a switch to choose between standard, NLQ (near letter quality) or condensed print.

The printer reviewed here was supplied by Watford Electronics and came complete with a free printer cable. It's important to let Watford Electronics know you require an Atari cable when you order the printer.

The printer connects to an Atari 850 interface box or you'll need a Centronics to Atari interface cable in place of the standard one supplied.

There are three buttons on the right-hand side of the printer controlling the online status, form feed and line feed. The feed buttons work while the printer is online so it was not necessary to use the button controlling this, unlike many other printers.

Above these switches are three small lights – power, paper/error and online. Power and online remain lit while the printer is being used and the centre one indicates things like paper-out or jammed.

The mains lead is permanently connected to the rear of the printer but needs a plug fitting. As it can't be removed, it gets in the way slightly if you move the printer, but at least you can't lose it.

The DIP switches are easily accessible under a piece of plastic near the print head. Flick it out of the way and the switches can be moved without searching for a screwdriver.

Epson compatibility is a feature advertised by many printer manufacturers. But just how compatible is compatible? Figure I shows the control codes and a P or E in the left-hand column shows ones applicable to Panasonic or Epson printers only. The Epson codes shown are those for an FX80 together with the extra ones from the LX-85.

A feature I occasionally use that was not available on the Panasonic was reverse paper feed, but this was more than compensated for by all the extra ones offered over my Epson FX80. This printer has been so well accepted in the office that someone asked if another printer is Panasonic compatible.

The KX-P1081 is rated at 120 characters per second. I compared the speed with an Epson FX80 rated at 160cps and found very little difference. In NLQ mode the speed drops to 24cps so it's a good idea to check the document in draft before moving to NLQ.

In some circumstances the Panasonic is faster than the Epson. A point to bear in mind when you choose a printer is that speed is affected by things like head turn around time so the cps, while being an indication, does not give the whole story.

There is a built-in 1k buffer so a small document can be sent to the printer whole and you can continue working as it prints. Unfortunately there is no flush buffer button so if you make a mistake you have to wait while it empties or switch off.

The print head has nine pins and these are used to give a 9x9 matrix. In NLQ the matrix is 18x18. You can see from Figure I that a wide variety of typefaces and styles are available; The Figure itself was printed after sending the codes 27,33,4,27,83,1,27,65,4 and is shown full size.

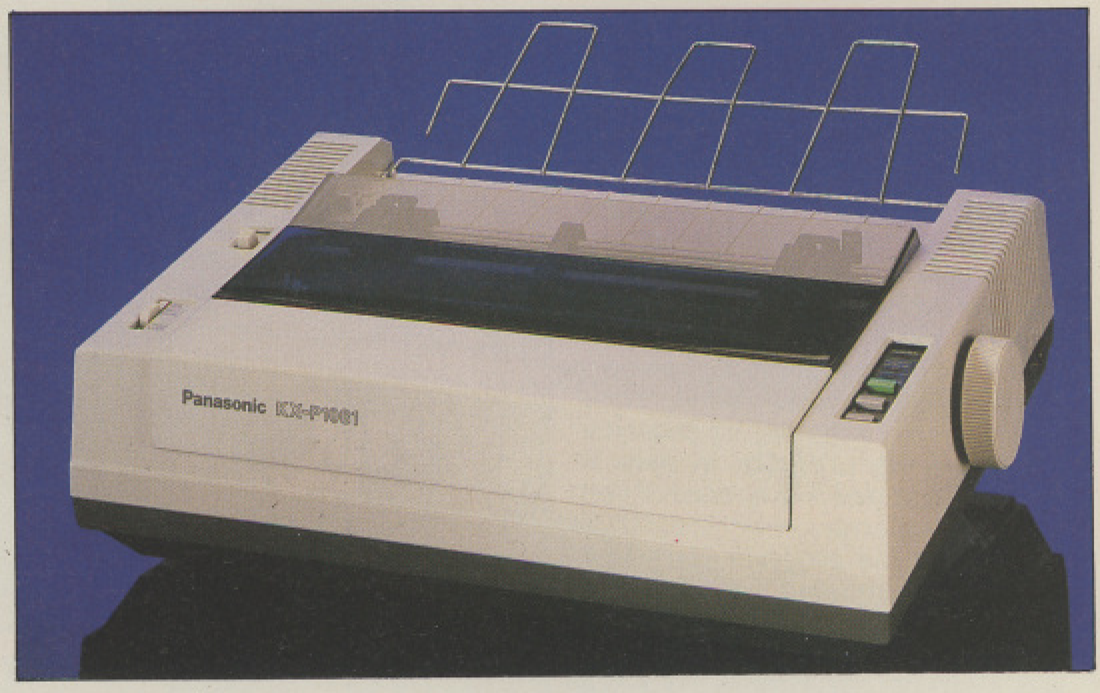
Figure II shows some of the many typefaces available and Figure III shows some NLQ text. As with all printers not all combinations of styles are available, but all the important ones such as NLQ italics are.

If the character you want is not available you can easily define your own. If you've ever defined a character on a micro you should have no problem. The horizontal and vertical lines in tables can easily be created using underline to draw across and by redefining ! (character 33) using the codes 27,121,33,0,0,0,0,255,0,0,0,0 to give upright bars.

The NLQ feature can be implemented using the switch on the left hand side of the printer or by sending control codes. It is slower than draft because the printer outputs part of the letters, moves the paper slightly and then goes over them again to give four times the dot density. The last line of Figure III shows a line of text interrupted during the second pass of the print head.

Printing is rather noisy compared to more expensive printers, but it is acceptable. It can be quietened using the half-speed and/or single-direction printing modes, but I'd rather put up with the noise and benefit from the speed.

Fanfold paper feeds in easily but



Product: KX-P1081 Panasonic Printer
Price: £171.35
Supplier: Watford Electronics, Jessa House, 250 Lower High Street, Watford WD1 2AN.
Tel: 0923 37774

CHARACTER MODE

	Cancel condensed	18
	Cancel one-line double width	20
	Set condensed	15
	Set one-line double width	14
	Set pica pitch	27,80
	Set elite pitch	27,77
	Set double width	27,87,1
	Cancel double width settings	27,87,0
	Set superscript mode	27,83,0
	Cancel sub/superscript mode	27,84
	Set subscript	27,83,1
	Set italic	27,52
	Cancel italic	27,53
	Select international set	27,82,n
	Set emphasised print	27,69
	Cancel emphasised print	27,70
	Set double printing	27,71
	Cancel double printing	27,72
	Sets underline	27,45,1
	Cancel underline	27,45,0
	Specifiy mode combination	27,33,n
P	Set NLQ (pica pitch)	27,110
P	Set NLQ (elite pitch)	27,111
P	Select character pitch	27,119,n
	Select NLQ font	27,120,1
	Select draft font	27,120,0
	Set proportional spacing	27,112,1
P	Cancel proportional spacing	27,112,0

BIT IMAGE (GRAPHICS) MODE

	Set single density	27,75,n1,n2
	Set double density	27,76,n1,n2
	Set double speed, density	27,89,n1,n2
	Set quadruple density	27,90,n1,n2
	Select 8-pin image mode	27,42,m,n1,n2
	Select 9-pin image mode	27,94,m,n1,n2
	Assign bit image density	27,63,n,m

LINE SPACING

	Line spacing 1/8"	27,48
	Line spacing 7/72"	27,49
	Line spacing 1/6"	27,50
	Line spacing n/72"	27,65,n
	Line spacing n/216"	27,51,n
	Spaces n/216" (1-line only)	27,74,n

PAPER FEED

	Moves to next top of form	12
	Moves paper one line	10
	Set skip perforation	27,78,n
	Cancel skip perforations	27,79
E	Reverse feed	27,106,n
	Paper feed execution	27,74,n

PAGE FORMAT

	Print then backspace one	8
	Executes horizontal tab	9
	Executes vetical tab	11
	Set horizontal tab	27,68,n1,...,nx,0
	Cancel horizontal tab	27,68,0
	Set horizontal tab	27,101,0,n
	Set vertical tab	27,66,n1,...nx,0
	Cancel vertical tab	27,66,0
	Set vertical tab	27,101,1,n
	Set page length in inches	27,67,0,n
	Set page length in lines	27,67,n
	Set column head (Left Margin)	27,73,n
	Set column end (Right Margin)	27,81,n
	Skips "n" position on line	27,102,0,n
	Skips "n" lines	27,102,1,n

WORD PROCESSING

	Enables left alignment	27,97,0
	Enables auto centering	27,97,1
	Enables right alignment	27,97,2
	Enables auto justification	27,97,3

DATA CONTROL

	Clears data in buffer	24
	Deletes last character	127
	Selects printer	17
	Deselects printer	19

DOWNLOAD CHARACTER

P	Define download character	27,121,loc,D1,D2,..D9
P	Cancel download character	27,122,loc

MISCELLANEOUS

	Homes print head	27,60
	Initializes the printer	27,64
	Set half speed	27,115,1
	Releases half speed	27,115,0
P	Set single direction	27,85,1
P	Releases single direction	27,85,0
	Enables paper-end detection	27,57
	Disables paper-end detection	27,56

E=Epson only
P=Panasonic only

Figure I: A wide variety of styles is available

you must ensure you feed it straight in at the back otherwise it soon snarls up.

There is no tear bar so you have to move forward to the next perforation to tear the paper easily.

The ribbon is a cartridge type and drops in with no problems at all. It's claimed to last for two million characters and there's a small button at the back of the cartridge you depress once printing becomes faint. This re-inks the ribbon and allows a further one million characters to be printed.

The manual is well written and far easier to understand than many I have seen. One of the appendices gives a summary of the features available, the code required to get them (in the form, for example, ESC+S+0) and a page reference. That page translates this to 27,83,n where n=0,48,178,176. A little confusing and all the options for n don't help, but far more helpful than the more usual form that the Escape codes are given in.

Each feature has a simple example to go with it. Unfortunately, they're not written for an Atari computer and they're not even all for the same micro. But in all of them it only needs a small change to allow the demonstration to be used on an Atari.

Overall this printer is excellent value for money. It does all the tasks you would expect of a low-cost dot matrix machine and works well with all the software I tried. It's an ideal companion to your Atari computer.

Here's Pica:	Here's Condensed:
Italic	Italic
Emphasised	Emphasised
Bold	Bold
Large	Large
Proportional	Proportional
Here's Elite:	Here's NLQ:
Italic	Italic
Emphasised	Emphasised
Bold	Large
Large	Proportional
Proportional	

Figure II: Sample styles

This is a demonstration
of NLQ printing in the
Elite Typeface.

NLQ is obtained by the
printer outputting part
characters, moving the
paper slightly and then
printing the rest.

When the printer is
stopped during NLQ output
it looks like this.

Figure III: NLQ output

Your HINTS & TIPS

Gauntlet

THE best character for a solo game is the Wizard, with his excellent magic abilities. In a two-player game the wizard teamed with either the elf or the warrior works best. The valkyrie, who seems to have the basics in all skills, loses out in that she is good at none of them.

All potions should go to the character with the best magic ability. If this seems unfair then the other characters should take care of the keys and be given the magic amulets.

Special potions that increase character abilities should be distributed very carefully. The armour potion should be given to the warrior or elf. Valkyrie doesn't need it and the wizard is given only minimal protection. The magic potion should be given to the elf or Valkyrie first. The wizard's power is not increased by it.

The shot speed potion is useful to anyone. The shot power can also be used by anyone as it increases damage done, but the fight power potion is best used by the elf, Valkyrie or the wizard – Thor the warrior is macho enough. The pick up power potion is best given to whoever is carrying the keys.

The maximum number of health points you can get is 9999. Some of the amulets can be shot, so take care.

To destroy bases in the later sections you have to shoot through the diagonals when this is possible. Death can be killed by transporting on to him, and when you use the transporters most of the time you move to the nearest transporter in the direction you are facing and you appear on the opposite side of the one you went in. – *Paul Collins, Lewes, Sussex.*

Kikstart

YOU will get maximum performance from your motorbike and start at top speed if you pull the joystick to the left as soon as you hear the starting tone. – *Edward Harwood, East Grinstead, West Sussex.*

Star Raiders II

IF you are having problems shooting the small Zylon fighters because they won't dive into your target sights when you are over a planet, simply change speed and they'll dive down into your sights. They are more willing to be shot when you vary your speed.

I have also noticed that you seem to be controlling the direction of the flagship. If you push your joystick down the flagship will respond in the same way. So if you move your joystick around quickly the ship will be more difficult to hit, so use very smooth joystick movements to line it up in your target sights – and then let it have it. – *Stephen Eversley, Hitchin, Hertfordshire.*

Timeslip

IF you are short of time after having collected all the orbs and then have to play through each section to get the clocks to zero, then go for a timeslip and this will usually drop the totals a little.

If you miss an orb, crash and take it again, to save you from having to go through the whole screen again. – *Paul Collins, Lewes, Sussex.*

Mercenary – The Escape

HERE are some tips for Mercenary to help novice players.

The first stage of your escape is to steal the Dominion Dart on the pad. Fly backwards at –625 to pick off the attacking Palyar. This will work for any attacking enemy.

Use the Anti-Grav to pick up the Neutron fuel. It will also pick up the interstellar craft so you can relocate it outside the defence complex.

Carrying the Metal Detector changes the colour of Benson's communications panel when you enter Palyar or any Mechanoid-held locations. – *Harry Sideras, Portsmouth, Hampshire.*

The Great American Road Race

ON the straight section of the race, if you move your car to the far left of the road, getting as close to the grass as you can without actually going on it, you will find you can merrily drive along at 240mph no matter how many cars are on the road. You can only do this on a straight and when you encounter a bend you must drive normally. – *Stephen Banks, Upminster, Essex.*

Drelbs

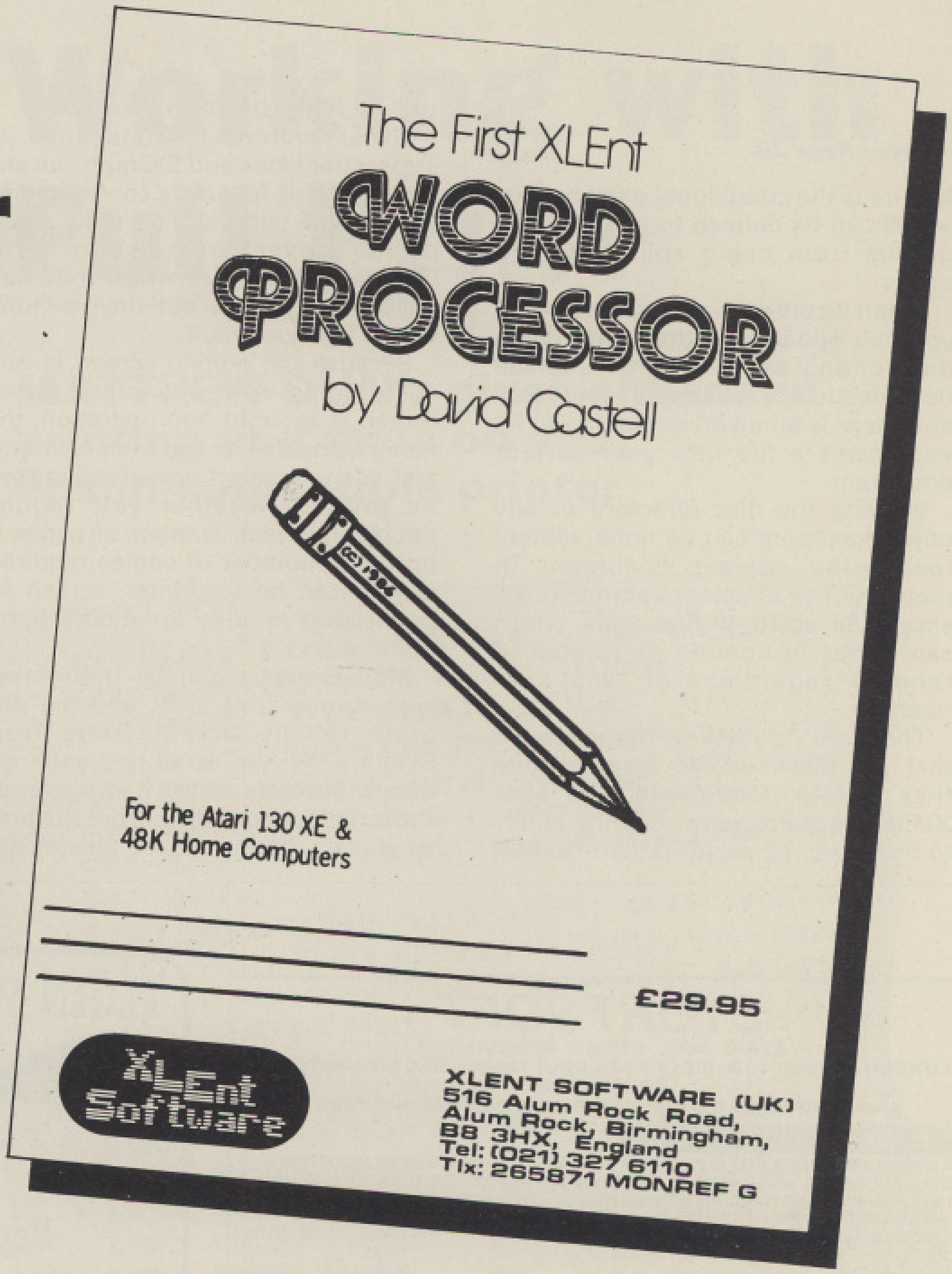
IF and when you see a blue diamond go around the flip grid and collect it. You will then enter the Drelbish corridor automatically. – *Edward Harwood, East Grinstead, West Sussex.*

Star Raiders

IF you find that one of your starbases has been surrounded hyperwarp into the sector next to the threatened one and wait until all the positions of the alien craft change. You then have 200 seconds to save the starbase from destruction. – *Jonathon Evans, Finchfield, West Midlands.*

Processor for all hands

ALAN GOLDSBRO tries it out



WHETHER you are a two finger typist struggling to reach 10 words per minute (wpm) or a fully fledged 80 wpm professional, a word processor can make all the difference to the production of your letters and documents.

The First XLEnt Word Processor is a major shift from the "printer" programs XLEnt Software has previously offered. Many of you may be familiar with Megafont II, Typesetter and Rubber Stamp and if you were favourably impressed by those offerings I'm sure this latest one will find a place in your collection.

Disc-based and requiring 48k, it can work on both 400/800 and XE versions. The host of features include insert and overwrite text modes, advanced screen editing, print preview in 80 columns, cut and paste block moves, search and replace or delete, chaining of files, dual text windows, mail merge, joystick cursor scrolling and icon-driven commands.

There are also special facilities for inserting pictures into your documents, and you can also define double column printing.

Typing is the same as using a typewriter but, apart from the obvious differences between word processing and typing, the major difference is in the speed you can move around your text. Both the standard cursor keys and the joystick will zoom you round the screen in seconds and by using the speed editor you can select a rate from one to nine, one being the fastest; three is the default speed.

You can easily set tabs to any predetermined place, while word wrap functions automatically and can be toggled off and on. A handy position marker will jump you directly to any of the five user-defined points in your document.

Background and text colours can be altered to suit individual tastes and even the cursor can be changed.

The cut and paste buffer will hold up to 800 characters, which is one screen (40 columns x 20 lines). Cut, copy and move functions are all operated from the icons seen at the bottom of the screen. The limitations of the text buffer can be offset by the ability to modify text within the buffer itself without harming the text in the document.

Dual windows can make a large document easier to edit plus two separate documents can be displayed in this fashion. The text buffer luckily supports both windows thus enabling the transfer of text.

Searching through your document is quite easy but this function will only read text downwards, so cursor position has to be at the top of the text you need to search. Working through the icon menu again, the search facility will not only work in replace mode but also in delete – you can replace a word with one of your choice or alternately delete the word.

Wildcards are allowed throughout and both uppercase and lowercase can be selected without defining. Global replace/delete or manual confirmation are as standard.

Your margins can be altered at any time, both indents and outdents are allowed along with justification of lines. Line spacing and page size follow the same easy structure. In fact most of the commands are embedded directly into the text document.

Headers and footers can be blocked left, right or centred. There's also automatic page numbering as part of the header/footer set up. A valuable

Turn to Page 24 ▶

◀ *From Page 23*

feature is the conditional page breaks, which can be defined to protect paragraphs from being split over two pages.

When it comes to saving your work, you can either save the entire document or only selective parts. Files can be added to any document in memory and there is an insert command to let you insert a file into your current document.

Viewing the disc directory or any other document can be done without losing the current document in memory. The directory command will show you up to 40 filenames, which can either be loaded or deleted at random regardless of what's in memory.

There are very few word processors that will allow you to insert picture files in text documents. The First XLEnt Word Processor has the ability to insert any 62 sector (Micro-Painter) picture file in between your text.

Other picture formats such as Typesetter icons and B/Graph can also be used. This feature is configured for Epson and compatibles only, but a printer driver construction set is included on the disc which may help 1029 owners print out their pictures within the document.

Because the editing screen is only 40 columns wide a printer preview screen is brought into operation, this feature doubles as the print formatter and lets you select how the page will be printed, whether you require double columns, number of pages to print and number of copies required. Output can be to printer, screen for previewing or disc for media transmitting.

Mail merging can be undertaken with comparative ease, and the program readily accepts data from Synfile+. All the usual text enhancements such as bold, italics, super/subscript are controlled from the printer drivers. These can be customised for the majority of printers available.

The XL/XE has a facility to insert international characters into a document and custom fonts can easily be loaded as the default text, although the standard Atari text is usually easiest to read.

I've only scratched the surface of what the First XLEnt Word Processor can do. As an avid user of Batteries Included's Paperclip, I'm impressed with the huge range of facilities available. Standards like these are hard to come by in 8 bit word processing.

Whether you're writing a short note to your granny or a full length review for *Atari User*, First XLEnt Word Processor will accommodate itself around your nimble fingers.

Product: First XLEnt Word Processor
Price: £29.95 (disc only)
Supplier: XLEnt Software, 516 Alum Rock Road, Alum Rock, Birmingham B8 3HX.
Tel: 021-327 6110

Working with Full Print

MATTHEW DUNN gives enhanced printing and style on your Epson-compatible printer

HAVE you ever wished that you could print out all those funny little characters that you used in your program or text on your Epson-compatible printer? Well here's a utility which will print out your listings or Ascii files using the full Atari character set – or any other set you have loaded in your micro.

First enter the listing. The lines of data have their own checksum on each line to help make sure that all the numbers are entered correctly. If there is anything wrong the program will tell you which lines are in error. You can also use the Get it Right! checksums as usual.

Next you will need to save your program by listing it to disc or tape using LIST"D:MYPROG.LIS" or LIST"C:". Check that your printer is on and ready, then run the program – Full Print.

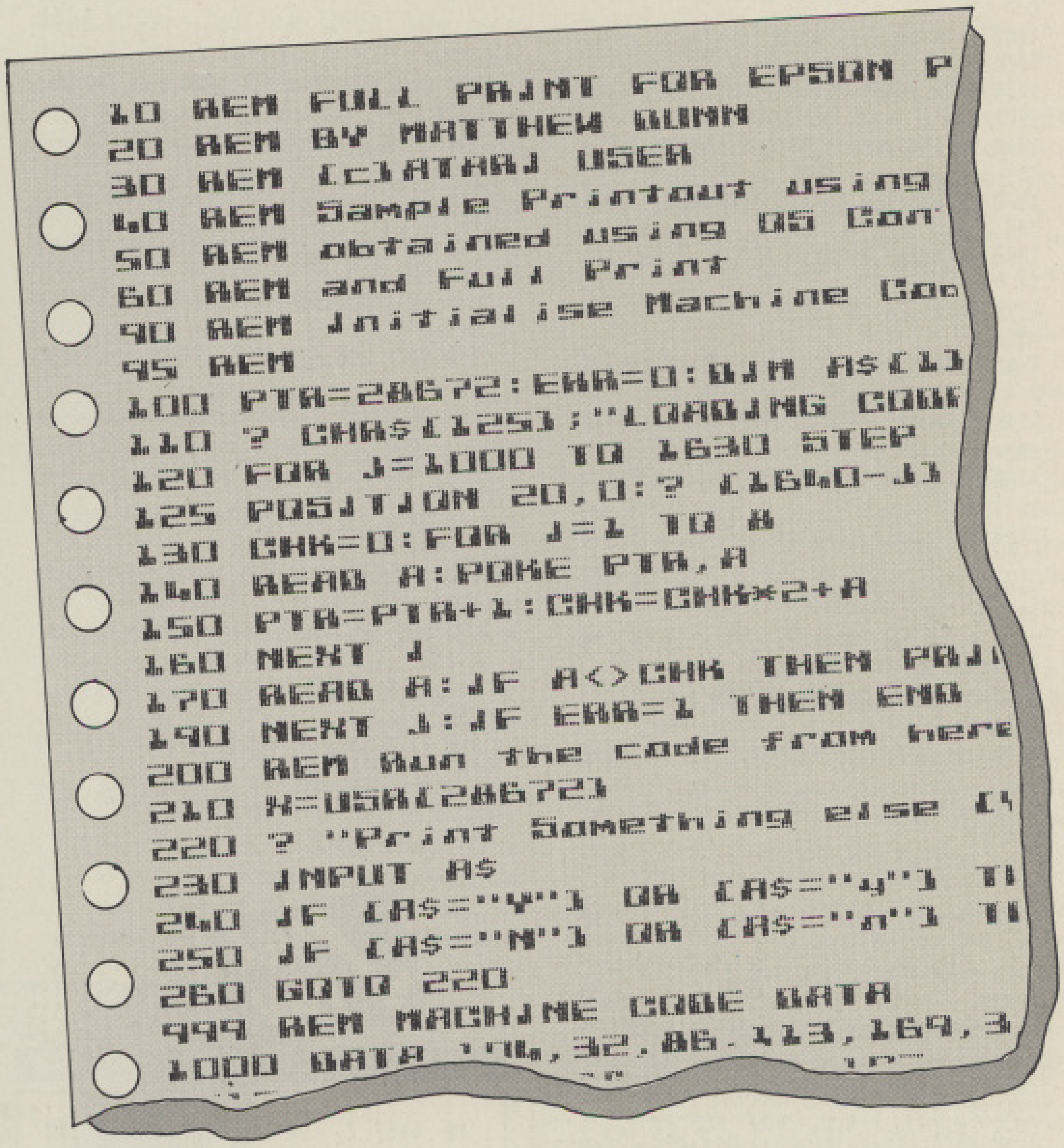
If it has been entered correctly it will ask for the name of the program to be listed. Put in the disc or tape with the listed program on it and then enter D:MYPROG.LIS or C: as appropriate. The printer will now start printing the program using the current Atari character set.

If you have other character sets they too could be used. To do this load one and set location 756 (CHBAS) to point to it as for any alternative character set. Now when you load and run Full Print it will use the character set you have just loaded.

If you wish to use this routine to present Mini Office II files in a new typeface, first save the file Ascii formatted to disc. Load in your special character set and run the Full Print program. When it prompts for the filename put the disc with the Mini Office II Ascii formatted file on it into the drive and enter the file's name.

The printer will then output your Mini Office II document using the special character set. Note the printer used must be Epson compatible and capable of printing graphics.

The program uses the ESC K (27,75) sequence to enable the graphics printing. These codes are held in the data statement on line 1630. If your printer uses different codes to enable the graphics change these two numbers (and the checksum) to the required values for your printer.

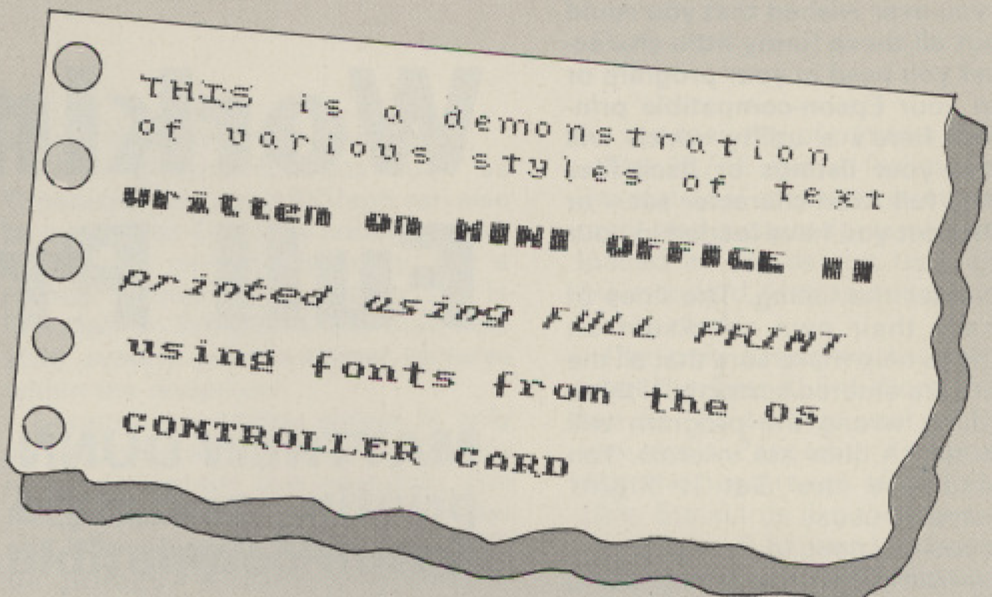


PROGRAM BREAKDOWN

100-190	Read in and check the machine code data
200-260	Run the machine code from Basic until stopped
1000-1630	Hold the machine code data

```
10 REM FULL PRINT FOR EPSON PRINTER
20 REM BY MATTHEW DUNN
30 REM (c)ATARI USER
40 REM
90 REM Initialise Machine Code
100 PTR=28672:ERR=0:DIM A$(1)
110 ? CHR$(125);"LOADING CODE..."
120 FOR J=1000 TO 1630 STEP 10
125 POSITION 20,0:? (1640-J)/10;" "
130 CHK=0:FOR I=1 TO 8
140 READ A:POKE PTR,A
150 PTR=PTR+1:CHK=CHK*2+A
160 NEXT I
170 READ A:IF A<>CHK THEN PRINT "** ER
ROR IN LINE #";J:ERR=1
190 NEXT J:IF ERR=1 THEN END
200 REM Run the code from here...
210 X=USR(28672)
```

Turn to Page 26 ▶



◀ From Page 25

```
220 ? "Print Something else (Y/N) ";
230 INPUT A$
240 IF (A$="Y") OR (A$="y") THEN 210
250 IF (A$="N") OR (A$="n") THEN END
260 GOTO 220
999 REM MACHINE CODE DATA
1000 DATA 104,32,86,113,169,3,162,112,
21720
1010 DATA 157,66,3,169,192,157,68,3,29
423
1020 DATA 169,113,157,69,3,169,8,157,3
5865
1030 DATA 74,3,32,107,113,16,3,76,1345
0
1040 DATA 86,113,162,0,169,11,157,66,2
5200
1050 DATA 3,169,204,157,68,3,169,113,2
1247
1060 DATA 157,69,3,169,22,157,72,3,282
63
1070 DATA 169,0,157,73,3,32,107,113,28
303
1080 DATA 162,0,169,5,157,66,3,169,279
19
1090 DATA 226,157,68,3,169,113,157,69,
43387
1100 DATA 3,169,15,157,72,3,169,0,1511
8
1110 DATA 157,73,3,32,107,113,162,16,2
7024
1120 DATA 169,3,157,66,3,169,226,157,2
9213
1130 DATA 68,3,169,113,157,69,3,169,17
819
1140 DATA 4,157,74,3,32,107,113,48,139
34
1150 DATA 169,169,0,141,254,113,141,25
5,37725
1160 DATA 113,169,0,133,203,169,114,13
3,30069
1170 DATA 204,162,16,169,7,157,66,3,40
515
1180 DATA 169,241,157,68,3,169,113,157
,44251
1190 DATA 69,3,169,1,157,72,3,169,1616
7
1200 DATA 0,157,73,3,32,86,228,16,1350
4
1210 DATA 10,192,136,240,3,32,113,113,
22251
1220 DATA 76,86,113,173,241,113,201,15
5,24553
1230 DATA 208,37,160,0,145,203,162,112
,36520
1240 DATA 169,9,157,66,3,169,252,157,2
9649
1250 DATA 68,3,169,113,157,69,3,169,17
819
1260 DATA 144,157,72,3,169,2,157,73,32
579
1270 DATA 3,32,107,113,76,121,112,173,
9153
1280 DATA 241,113,74,74,74,74,74,41,42
709
1290 DATA 3,170,189,188,113,77,241,113
,22127
1300 DATA 141,241,113,169,0,133,209,17
3,40915
1310 DATA 241,113,41,127,10,38,209,10,
42084
1320 DATA 38,209,10,38,209,133,208,24,
21812
1330 DATA 165,209,109,244,2,133,209,16
0,43014
1340 DATA 0,162,0,177,208,10,62,243,15
271
1350 DATA 113,232,224,8,208,247,200,19
2,39852
1360 DATA 8,208,238,173,241,113,41,128
,27310
1370 DATA 240,13,162,8,189,242,113,73,
39643
1380 DATA 255,157,242,113,202,208,245,
162,55340
1390 DATA 0,160,0,189,243,113,145,203,
16153
1400 DATA 232,238,254,113,208,3,238,25
5,57271
1410 DATA 113,230,203,208,2,230,204,22
4,40576
1420 DATA 8,208,232,76,137,112,162,112
,24956
1430 DATA 169,12,157,66,3,32,107,113,2
8959
1440 DATA 162,16,169,12,157,66,3,32,28
918
1450 DATA 107,113,96,32,86,228,48,1,26
209
1460 DATA 96,169,48,141,202,113,141,20
1,29447
1470 DATA 113,141,200,113,238,202,113,
173,34807
1480 DATA 202,113,201,58,208,23,169,48
,42590
1490 DATA 141,202,113,238,201,113,173,
201,41007
1500 DATA 113,201,58,208,8,169,48,141,
33489
1510 DATA 201,113,238,200,113,136,208,
220,45860
1520 DATA 162,0,169,194,157,68,3,169,3
0951
1530 DATA 113,157,69,3,169,40,157,72,2
8666
1540 DATA 3,169,9,157,66,3,32,86,14690
1550 DATA 228,160,255,96,64,32,96,0,49
952
1560 DATA 80,58,69,82,82,79,82,32,1864
0
1570 DATA 48,48,48,155,83,111,117,114,
14688
1580 DATA 99,101,32,102,105,108,101,32
,23298
1590 DATA 70,105,108,101,115,112,101,9
9,22421
1600 DATA 32,58,32,32,32,32,32,32,9824
1610 DATA 32,32,32,32,32,32,32,32,8160
1620 DATA 32,0,0,0,0,0,0,0,4096
1630 DATA 0,0,0,0,27,75,8,0,532
2000 REM 27,75 ABOVE = ESC K FOR EPSON
 GRAPHICS
9000 END
```

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	6667	20	4148	30	3380
40	871	90	7159	100	4707
110	5170	120	4257	125	5117
130	3366	140	3468	150	4028
160	1345	170	10652	190	5243
200	7168	210	2230	220	7279
230	1644	240	5212	250	5400
260	1616	999	4020	1000	5923
1010	5648	1020	5846	1030	5422
1040	5734	1050	5762	1060	5571
1070	5638	1080	5630	1090	6040
1100	5453	1110	5718	1120	5848
1130	5731	1140	5533	1150	6292
1160	6204	1170	5641	1180	6268
1190	5571	1200	5424	1210	5875

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
1220	6289	1230	6153	1240	5876
1250	5731	1260	5638	1270	5745
1280	5659	1290	6289	1300	6217
1310	5955	1320	5962	1330	6214
1340	5540	1350	6274	1360	6192
1370	5961	1380	6477	1390	5915
1400	6309	1410	6191	1420	6226
1430	5787	1440	5653	1450	5619
1460	6273	1470	6440	1480	6222
1490	6403	1500	6006	1510	6441
1520	5799	1530	5790	1540	5268
1550	5708	1560	5532	1570	6010
1580	6173	1590	6212	1600	5168
1610	5133	1620	3989	1630	4022
2000	7784	9000	836		

Fast access

ANDRE WILLEY takes the Supra hard disc drive for a spin

DO you remember the day when you finally scraped together enough cash to buy your first disc drive? Tapes suddenly became a thing of the past as you marvelled at the speed of your new acquisition.

Operations which used to take 10 minutes were now finished in as many seconds. But time passes and you start noticing that discs aren't perhaps all they were cracked up to be.

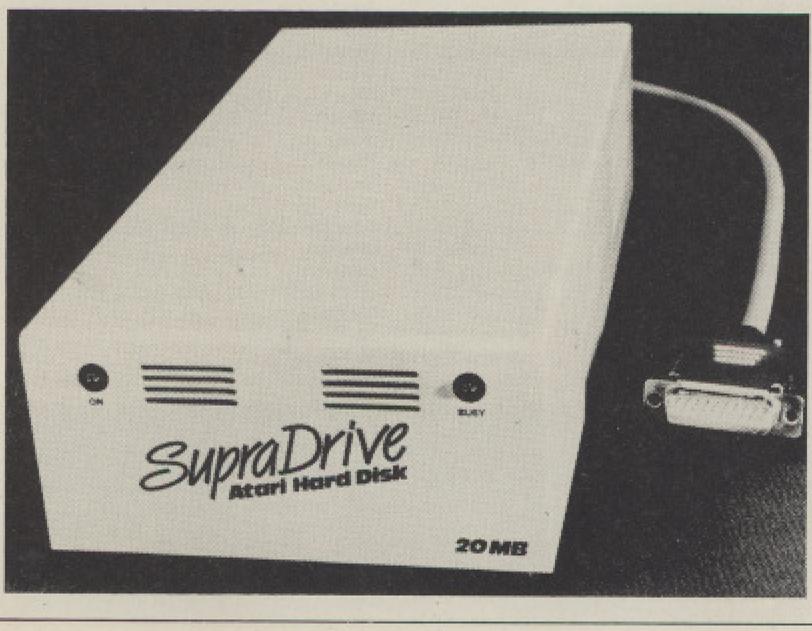
Have you ever tried to re-save a long file with Dos 2.5? Or copy such a file in append mode? Okay, so it's faster than tape but it still takes a while, doesn't it?

The answer, as all business computer users will know, is to use a hard disc unit – but until now such a thing has been difficult to get for an 8 bit Atari.

Enter the Supra Corporation in America who saw the need for a high speed interface which would allow the use of a hard disc, and so designed one. Marketed for the first time in the UK by Frontier Software, the Supra 20 Mb drive is now available from your local Atari dealer.

So what is a hard disc, and how does it work? Well, it's not really all that different from an ordinary floppy disc, but it spins very much faster and is sealed inside an airtight container. This single, non-removable, unit can pack up 20 megabytes of data on to its surface.

The access speed is also very much greater than an ordinary floppy, with data being read and written many times faster than the serial drives are able. Because a hard disc requires a far greater track reading accuracy than a floppy, the disc itself is sealed inside an airtight box to avoid contamination from the dust and moisture in the air.



The Supra contains a 3.5in mechanism, which means that it is considerably smaller than a 1050 drive (albeit a little longer) measuring just 14 cm by 7 cm by 28 cm. In addition to the drive itself you will need to find desk space for the SCSI interface module which plugs into the parallel port at the back of an 800XL.

This module takes its power from the drive unit and so only one mains cable is required – and no more extra black boxes since the transformer is built into the casing. As a bonus, the interface also provides a high speed parallel Centronics printer port running at some 8 to 10 thousand characters a second.

130XE users need not worry because a special converter board is also supplied for your machine which also extends the cartridge port making it much more accessible.

Once you've connected the unit to your computer you're ready to initialise the system. Rather like floppy discs, the hard disc must be formatted before you can use it.

Firstly you should boot the Dos floppy disc which is provided with the drive. My review sample was supplied with MyDos – a slightly modified version of Atari Dos 2.0 – which is frankly a bit of a muddle, and the whole Dos 2.0 file system is not really geared up to using 20Mb of space effectively.

Frontier Software had obviously already come to this conclusion and the drive is now being packed with SpartaDos – probably the most powerful available for the 8 bit Atari.

The interface is capable of deciding if the hard disc is ready for use, and if not it will boot from floppy disc two (so don't forget to alter the drive select switch at the back of your 1050).

Once SpartaDos has loaded you should run the format program provided. This will format, partition and zero the drive ready for use. Formatting will probably already be familiar to you, but partitioning may be a new concept.

Since the hard disc can contain such a large amount of information it is split up into smaller, more manageable, units which the computer can treat as different drives. Thus a small partition of 180k is set up as drive one (and will be booted from each time you power up the system), while the rest of the space is allocated equally between two fictitious drives numbered 3 and 4.

Files may be accessed by using D1:, D3: and D4: respectively. D2: refers to the real floppy disc drive you first booted from. After each of these partitions has been zeroed you may write your Dos files to the fake drive one and you're ready to go.

At this point it's best to re-boot the system from scratch to check you've done everything correctly. The computer will automatically load SpartaDos from the fake drive one unless you hold down the Help key to indicate a floppy boot is required (to load game discs and so on).

I tested the load time using SpartaDos with a standard 1050 and then using the Supra Drive – the 1050

Turn to Page 28 ▶

Test	1050	Supra
Load 18970 byte file	19.28	2.28
Save 18970 byte file	21.91	2.66
Open/close outputfile (20 times)	34.12	6.52
Open/close input file (20 times)	4.94	1.06
Write 50,000 bytes	48.92	5.08
Read 50,000 bytes	46.76	4.68

Figure I: Speed comparison table

◀ *From Page 27*

loaded in about 18 seconds and the Supra took just 4.5. Both of these times include a 2.5 second poll to check for available drives, so the actual Dos loading times are more like 15.5 seconds and 2 seconds.

When you start loading and saving files the speed differences are even more pronounced, with most operations running about 10 times faster on the Supra – see Figure I. According to the manual, data transfer runs at around 10,000 bytes a second, and operations which used to take some considerable time now occur almost instantaneously.

SpartaDos is ideally suited for using with a hard disc for two reasons. Firstly it allows just about any length of file you want – if you want a couple of megabytes of data, so be it. Secondly, it supports sub-directories which are vital when using such a high capacity drive.

Within the main directory for each drive you may assign new directories which can be called at will. Thus D1: may contain amongst its normal files the directory DATA which in turn might contain some more files and another sub-directory called HELP, and so on. If the file WORDPRO.INS was contained inside the directory HELP then it would be called up by using:

D1:DATA>HELP>WORDPRO.INS.

Other features include a menu system that is almost entirely cursor and function key controlled, plus a whole host of other special files. A read-time clock/calendar is available on-screen, and all files are time/date stamped when written or modified. SpartaDos has its own special disc format, but it is also quite capable of reading and writing to standard Atari Dos 2.0 discs – in any density.

Many machine code monitor and display routines are available, plus batch execution files, disc management programs, various Ramdisc options and numerous other features. It is also capable of running a 1050 at about three times normal speed if you've fitted a US Doubler chip (at £29.95).

Using a hard disc does have its drawbacks, though. Copy protected programs can't be transferred onto the system, or non-standard format discs but so long as a program may be loaded from SpartaDos and uses the correct channels for its data storage there is no reason why it shouldn't work. Also, operations which are inherently slow because of the operating system (such as PUT and GET) will not show such dramatic speed improvements.

The other crushing blow for dedicated Atarians is that the drive will only work with XL or XE computers, due to the fact that it requires access to the parallel port at the rear of the more recent machines.

I've been using my Supra for a month now, and I can't envisage life without it any more. That said, unless you use your machine mainly for programming or you run a bulletin board, the £750 price tag might seem rather difficult to justify.

But if you can afford it and you would like to see your Atari disc access times improved, there would seem to be no better choice than a Supra drive.

Product: Supra 20Mb Hard Disc
Price: £749.95
Supplier: Frontier Software, PO Box 113, Harrogate, North Yorkshire, H92 OBE
Tel: 0423 67140

More from Zork and the Ballyhoo man

by Rouloc

WELL here I am again after yet another adventure into the great unknown, and this time I have brought back some great news for Infocom fans.

Due out any time now is another new release from these masters of the text adventure. Don't know about you, but I simply can't get enough of Infocom – they just seem to go from strength to strength.

The most exciting part of this news is that the new adventure is called Beyond Zork. Now in my book the Zork trilogy is an all-time classic, so the fact that there will now be an addition to the series fills me with glee.

Another release is one that I have mentioned before, but here is some more gossip on it: It is a real weird one and you couldn't really forget the title – Nord and Bert Couldn't Make Head Or Tail Of It.

Jeff O'Neill, author of that splendid circus mystery, Ballyhoo, is the perpetrator of this highly unusual product.

The program consists of eight vignettes, all set in a town called Punster. As you might possibly guess from that, the tales are all concerned with English Language pyrotechics. The idea is for the player to solve the various plays on words that abound in each story.

Nord and Bert is a long way from the usual Infocom adventure. For a start, each tale can be completed individually. There is no mapping to be done and you may be pleased to know that there are built-in hints for you to avail yourself should the going get too hard.

The individual titles of this octet, with a hint of what they contain in brackets, are Shopping Bizarre (similar sounding words), Shake A Tower (Spoonerisms), Buy The Farm (cliches), Act The Part (Fifties-style situation comedy), Play Jacks (words beginning with "jac"), Eat Your Words (idioms), Visit The Manor of Speaking (literal meanings?) and finally, Meet The Mayor, which can only be played when you've solved all the others.

If you like word games, an intellectual challenge spiced with plenty of

Turn to Page 30 ▶

Hints & tips

BUREAUCRACY

Old lady blasting you?
Ring the bell then sprint round the back and grab the portrait before she returns.

Macaw won't give up the mail?
Show it the portrait – that should make it see red!

Puzzled by the llama?
Open the mailbox, open the bag of llama treats, put the bag in the box then look in the trough.

Baffled by the postal stickers?
Jot down the order in which you found them and watch out – those items get shuffled about each time you start a new game. The stickers are no use in themselves but you'll need to remember the order in which they were collected when you get further into the game.

HOLLYWOOD HI-JINX

Atomic chihuahua a problem?
Hit the buttons in this order. Green thrice, black twice, white twice, green thrice, black once, blue once, green four times and lastly red three times. Phew!

Safe won't open?
Look at the names on the safe plaque. Levy, Regan, Lebling. Take the initial letter for direction and the number of letters as the number for the combination. Yep, left to 4, right to 5 and right again to 7. Click! Easy when you know how!

Can't grab the sack in the window?
Hold the sack, open the window then open the sack. Easy peasy.



◀ *From Page 29*

the traditional Infocom wit and humour, then Nord and Bert looks like a program you'll enjoy. Watch out for a full review in *Atari User* soon.

Turning to the cries for help that continue to pour in, I thought that I'd stick with Infocom this month and help you along the way with a few tips for Hollywood Hi-Jinx and Bureaucracy.

Be back in a month – keep that brass lamp well fill until then!

See you next month

Review

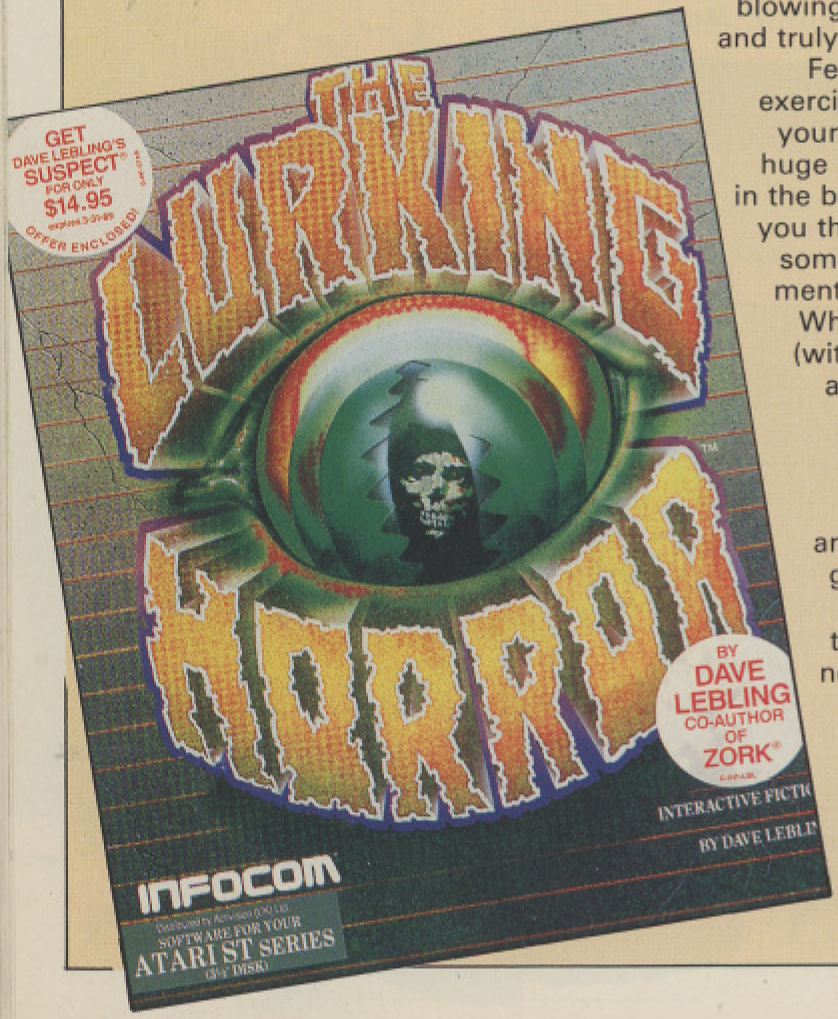
Something nasty lurks ...

> *Program: The Lurking Horror*
> *Price: £24.99*
> *Supplier: Infocom, c/o Activision, 23 Pond Street, Hampstead, London NW3 2PN. Tel: 01-431 1101*

"BY the pricking of my thumbs, something wicked this way comes". Perhaps you recognise that as a quotation from Macbeth or as a part title of a Ray Bradbury book (he borrowed it from our Will).

Whether you do or not (and even I was forced to look it up in my Wizard's Book of Knowledge for Dolts and Total Ignoramuses – Ruoloc may be pretty but he's not awfully bright), I'm sure you'll agree that those words beautifully convey the sense of something unspeakably nasty waiting just round the corner.

That quotation would be equally appropriate for Infocom's latest text adventure, The Lurking Horror. Now if, like me, you enjoy a good vicarious scare (always providing you're really safe at the time), then Infocom have got just the bag of creepy-crawlies for you.



You are a student attending the George Underwood Edwards Institute of Technology, about which many unwholsesome rumours have been circulating, such as beware of ghastly goings-on in the basement, young master.

One snowy night, you return to the college to finish off a long overdue Classics paper . . .

After a swift fainting fit while seated at your computer terminal (it was something you read, not what you had for tea back at the digs), you begin to wish you had stayed at home. Too laté, old chum. There's now a blizzard blowing outside and you're well and truly stuck here for the night.

Feeling the need for a little exercise, you might care to try your hand at clearing away a huge pile of rotting junk down in the basement (I thought I told you there were rumours about something nasty in the basement – never learn, do you?). When the rubbish is shifted (with some mechanical aid), another room is revealed. And therein sits a closed manhole cover. Now just like those poor innocent twits who, when lost and soaked in a rainstorm, go knocking on the castle door at midnight, failing to notice the 20 foot high neon sign that says "Chez Dracula", no doubt you will wish to open the cover and descend. Don't say you weren't warned. In a cave down below is what looks suspiciously like an altar. No cuddly toy for guessing what those red stains are (serves you right for climbing down manholes, nosey). There's a knife lying nearby, its purpose obvious, wouldn't you say? But worst of all is the sliding iron plate embedded in the floor. Pull that to one side and the hairs on the back of your neck are likely to do handstands.

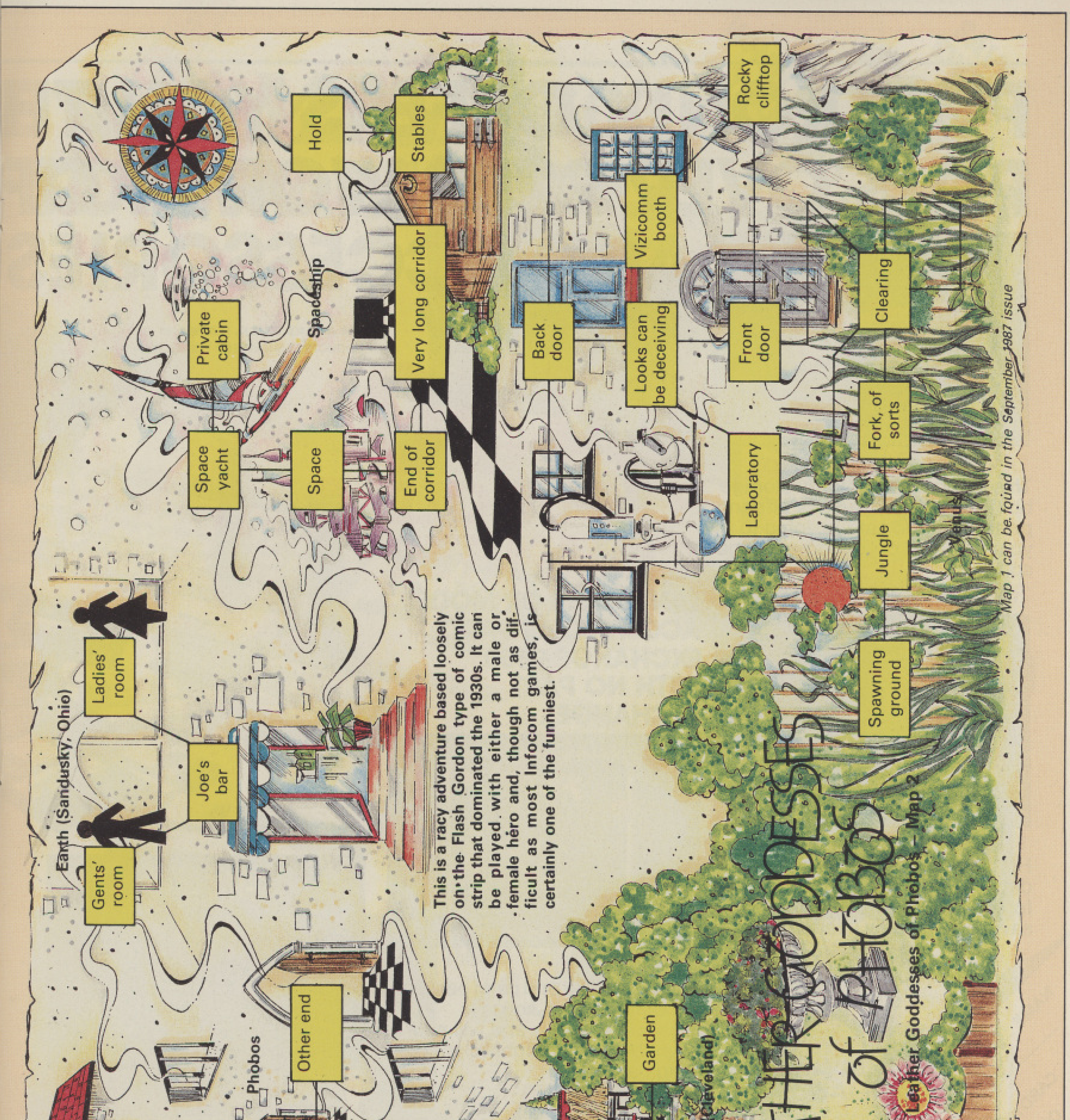
Greyfriars was never like this, master. As the fat owl himself might have said if he were in your current shoes, "Oh, lor! Oh, crikey!". Given the nightmarish experiences you are about to undergo, you could be forgiven for using stronger language than Bunter's.

Elsewhere, down on one of the campus floors, a maintenance man is polishing away on his mobile machine, a strange gleam in his eyes (if not on the floor). He will not let you pass. Taking an axe to him may seem like a petty over-reaction on your part to his unfriendliness but prepare to be shocked if you do decide to atack him. And, perhaps I should add in all fairness, prepare also to be throttled for your impertinence in assaulting what now appears to be one of the undead. Yep, a zombie.

And there's far more horrible things lurking around the campus. What IS going on? Among the treats in store are voracious rats, a loathsome slimy tentacled thingy, a winged watchyoumaycallit, something dead and unpleasant in a plant tub and a mob of chanting zombies for starters. Can you get out alive? Will you ever sleep soundly again?

The Lurking Horror was written by Dave Lebling, famed writer of the Zork trilogy and four other Infocom adventures. He has come up with a tale that brings together many of the elements found in the best horror stories like those by such notables as Stephen King, H.P. Lovecraft and James Herbert.

This is another original triumph for Infocom who just can't seem to put a foot wrong, thank goodness. So turn down the lamp, shut the door and get down to playing The Lurking Horror. But try not to keep looking over your shoulder.

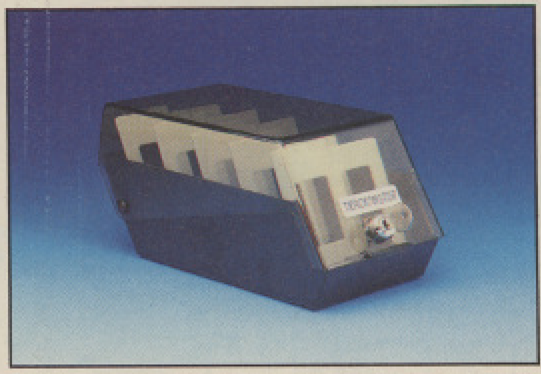


This is a racy adventure based loosely on the Flash Gordon type of comic strip that dominated the 1930s. It can be played with either a male or female hero and, though not as difficult as most Infocom games, is certainly one of the funniest.

Leather Goddesses of Phobos – Map 2

Map 1 can be found in the September 1987 issue

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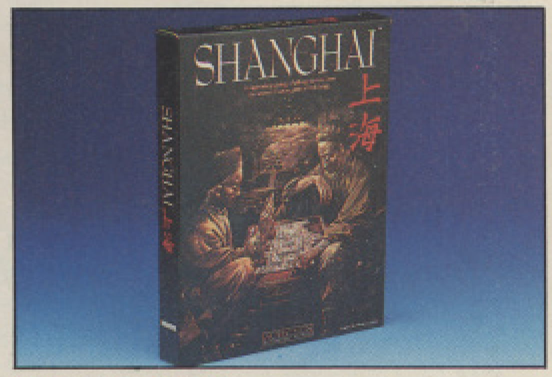
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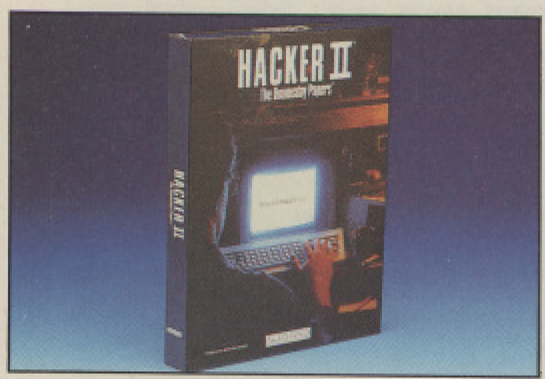




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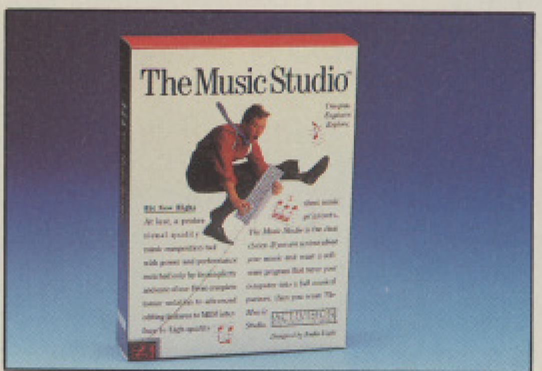
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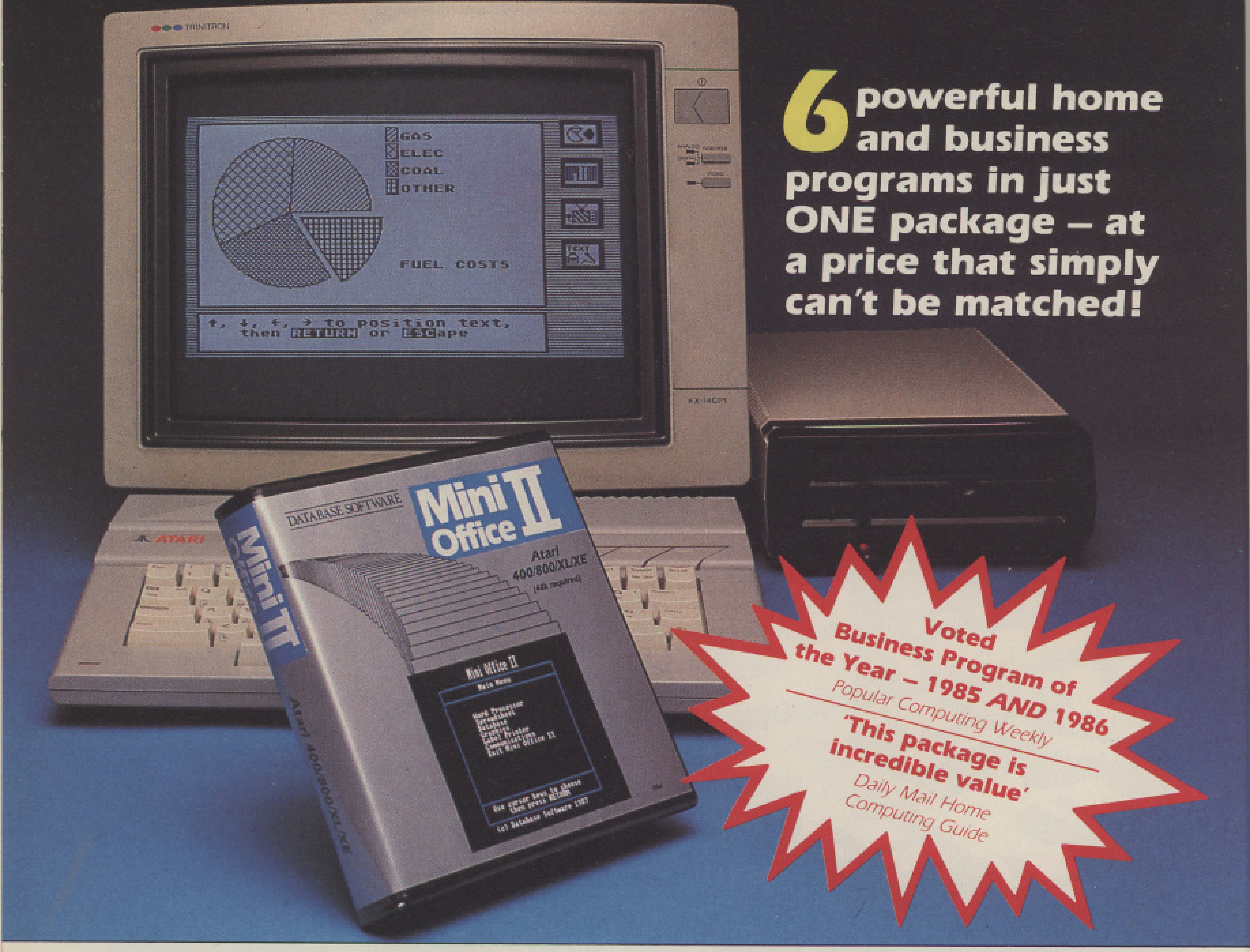
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AT10

Doctor Boris

Play ALEX DEWDNEY's game of the month

YOUR name is Doctor Boris. You have just graduated from medical school and have gone to work in a new hospital somewhere in the North of England. But the building work isn't complete and due to cutbacks in the NHS you have to go out there and do the work yourself!

Unfortunately the building site is littered with unexploded bombs, so as you rush about constructing the hospital you have to stop to defuse them before the entire area goes up in smoke.

To make things even worse, the dreaded Mad Norman is constantly bouncing about making sure you're not slacking. One touch from his deadly skin and you drop dead.

The final problem you face – and things are getting pretty desperate by now – is that the site is also full of half buried skulls which glow with the a radioactive light. Like Norman, these are fatal to the touch.

After the title page you find yourself in the middle of the screen surrounded by bushes, skulls and bombs. One of the bombs is slowly counting down from 10 to 0, and you must defuse it by walking over it.

As soon as one bomb has been defused, another starts to count down and it's up to you to carry on until the area has been made safe. At this point you proceed on to the next level. If you let a bomb reach zero it explodes and you lose a life but an extra life is awarded when you reach level eight.

As you move you build the new hospital wall behind you, and this sometimes blocks your path. If this happens you must use some of your limited supply of explosives by pressing the fire button and pushing the joystick in the direction required. Keep a careful watch on your dynamite gauge at the bottom of the screen, as your supply is used very quickly.

Play the game as fast as you can, as by doing this you gain more points. It is written entirely in Basic and is fairly short, so typing it in should pose no problems. Use the Get it Right! checksum to make sure you're correct. You'll find full details in the August 1986 issue of *Atari User*.



Turn to Page 36 ▶

◀ From Page 36

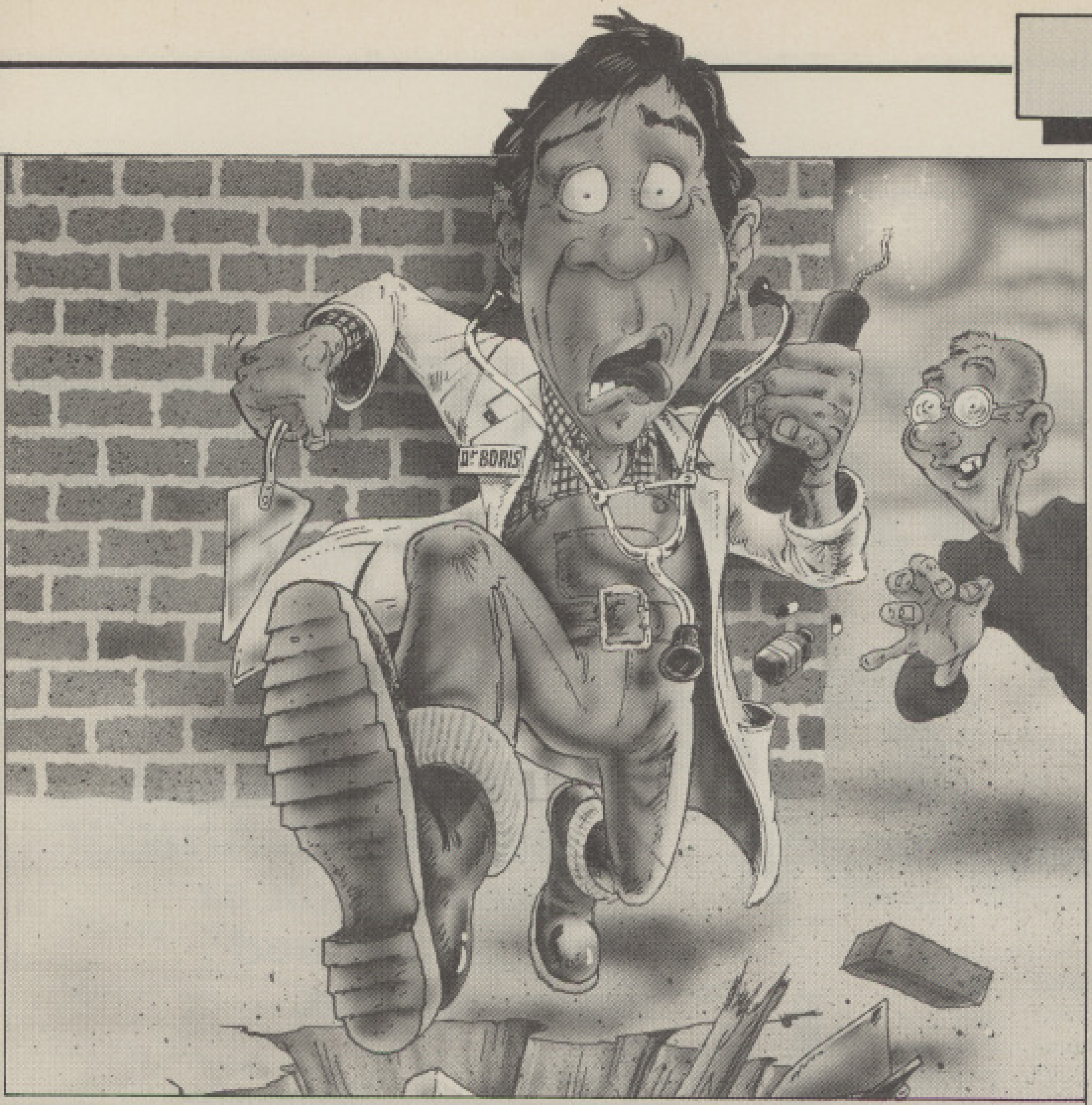
PROGRAM BREAKDOWN

60-70	Define arrays and main variables. Set graphics mode and call title page.
80-120	Move Mad Norman
130-230	Main loop. Read joystick. Move Boris and advance bomb countdown
240-290	Detect collisions
300-320	Fire dynamite
330-450	Draw main screen
460-580	Defuse bomb and checks to see if screen complete
590-620	Set up PMG to form explosion gauge
630-880	Draw title page and effects
890-1000	Game over. Reset main variables and print score
1010-1530	Redefine character set

PROGRAM VARIABLES

A	Value for joystick input
B	Number of the bomb currently counting down
C	Counter for bomb
D	Variable for locate commands
S	Sound flag
X	X position for Boris
Y	Y position for Boris
AA	value counter for when bomb is defused
DL	Start of display list
EX	Amount of dynamite remaining
LL	Current level of play
LV	Number of lives left
MX	X position of Norman
MY	Y position of Norman
MH	Horizontal velocity of Norman
MV	Vertical velocity of Norman
NB	number of bombs on screen
SC	Score
DEC	Rate at which bomb counts down
CT$	Redefined characters used as numbers in countdown
BX(99)	X position of bombs
BY(99)	Y position of bombs

```
10 REM DOCTOR BORIS
20 REM BY ALEX DEWDNEY
30 REM (c)ATARI USER
40 DIM BX(99),BY(99),SET(4),CT$(10):CT$="!=#%&'@()<":GRAPHICS 17:GOSUB 1000:SC=0:LL=0:LV=3:GOSUB 620:GOSUB 580
50 GOTO 120
60 REM  MOVE MEANIE
70 LOCATE MX+MH,MY,M:IF M<>32 AND M<>42 THEN MH=-MH
80 LOCATE MX,MY+MV,M:IF M<>32 AND M<>42 THEN MV=-MV
90 MX=MX+MH:MY=MY+MV:POSITION MX,MY:? #6;"?":POSITION MX-MH,MY-MV:? #6;" "
100 RETURN
110 REM  MAIN LOOP
120 ? #6;"K":POSITION 0,0:X=10:Y=11:EX=20:D=0:DEC=0.1+(LL/5)
130 MX=3:MY=3:MH=1:MV=1:GOSUB 320
140 B=1:C=10.2:POSITION X,Y:? #6;"*":TRAP 930
150 A=STICK(0):IF S=1 THEN S=0:SOUND 1,0,0,0
160 POSITION BX(B),BY(B):? #6;CT$(C,C):C=C-DEC:IF C<0.7 THEN GOTO 920
170 IF A=11 THEN LOCATE X-1,Y,D:IF D=32 THEN X=X-1:POSITION X,Y:? #6;"*q":GOTO 210
180 IF A=7 THEN LOCATE X+1,Y,D:IF D=32 THEN X=X+1:POSITION X-1,Y:? #6;"q*":GOTO 210
190 IF A=13 THEN LOCATE X,Y+1,D:IF D=32 THEN Y=Y+1:POSITION X,Y:? #6;"*":POSITION X,Y-1:? #6;"q":GOTO 210
200 IF A=14 THEN LOCATE X,Y-1,D:IF D=32 THEN Y=Y-1:POSITION X,Y:? #6;"*":POSITION X,Y+1:? #6;"q"
210 IF D=32 AND A<>15 THEN SOUND 1,50,10,10:C=C-0.05:S=1:GOSUB 70:GOTO 150
220 IF (D>160 AND D<193 AND D<>171) THEN GOSUB 450
230 IF STRIG(0)=0 AND EX>4.5 THEN GOSUB 290
240 IF D=234 OR D=232 THEN GOTO 880
250 IF (LL*20)>2 THEN GOSUB 70
260 IF MX=X AND MY=Y THEN BX(B)=X:BY(B)=Y:GOTO 920
270 GOTO 150
280 REM  DYNAMITE
290 EX=EX-0.5:POSITION X-(A=11)+(A=7),Y-(A=14)+(A=13):? #6;" ":POSITION X,Y:? #6;"*":SOUND 1,50,8,15:S=1:POKE 53248,EX*10
300 A=0:RETURN
310 REM  DRAW MAIN SCREEN
320 POKE 559,0:POKE 53248,0:COLOR 121:PLOT 0,1:DRAWTO 19,1:PLOT 19,1:DRAWTO 0,1:DRAWTO 0,21:DRAWTO 19,21
330 POKE DL+24,6:POKE DL+8,6:POKE DL+28,7
340 PLOT 19,22:DRAWTO 0,22:PLOT 19,22:DRAWTO 19,1:NB=INT(1+LL*40)+1:IF NB>99 THEN NB=98
350 FOR T=1 TO NB:BX(T)=INT(1+RND(0)*17):BY(T)=INT(2+RND(0)*18):NEXT T
360 FOR T=1 TO NB:POSITION BX(T),BY(T):? #6;"▪":NEXT T
370 FOR T=1 TO 5+RND(0)*3:XX=1+RND(0)*17:YY=2+RND(0)*17:POSITION XX,YY:? #6;"z":POSITION XX,YY+1:? #6;"x":NEXT T
380 FOR T=1 TO 2+RND(0)*3:XX=1+RND(0)*17:YY=2+RND(0)*17:POSITION XX,YY:? #6;"▀":POSITION XX,YY+1:? #6;"▄":NEXT T
390 POSITION 0,23:? #6;" DOCTOR BORIS/ ";SC;
400 POSITION 0,22:? #6;"^^^^^^^^^^^^^^^^^^^^^"
410 POSITION 0,0
420 ? #6;"  LEVEL,";1+INT(LL*20);" LIVES,";LV;" "
430 POKE 53248,EX*10:POKE 559,42:RETURN
440 REM  DEFUSE BOMB
450 SOUND 1,40,10,15
460 IF A=11 THEN X=X-1:POSITION X,Y:? #6;"* "
470 IF A=7 THEN X=X+1:POSITION X-1,Y:? #6;" *"
480 IF A=13 THEN Y=Y+1:POSITION X,Y:? #6;"*":POSITION X,Y-1:? #6;" "
490 IF A=14 THEN Y=Y-1:POSITION X,Y:? #6;"*":POSITION X,Y+1:? #6;" "
500 SOUND 1,0,0,0
510 AA=C:C=10.2:B=B+1:IF B=NB+1 THEN GOTO 530
520 SC=SC+(AA*30):POSITION 15,23:SC=INT(SC):? #6;SC;:D=32:RETURN
530 FOR T=255 TO 10 STEP -25:FOR V=16 TO 0 STEP -1:SOUND 2,T+V,10,V:NEXT V:NEXT T:LL=LL+0.05:ELP=1
540 IF ELP=1 THEN ELP=0:IF 1+INT(LL*20)=8 AND EL=1 THEN EL=0:FOR T=15 TO 0 STEP -0.2:SOUND 1,10+T,10,10:NEXT T:LV=LV+1
550 SOUND 1,0,0,0
560 GOTO 120
570 REM  SET UP SPRITE
580 P=PEEK(106)-8:POKE 54279,P
590 POKE 53277,2:POKE 704,152:POKE 559,42
600 PMB=P*256:FOR T=PMB+512 TO PMB+768:POKE T,0:NEXT T:FOR T=PMB+616 TO PMB+618:POKE T,63:NEXT T:RETURN
610 REM  DRAW TITLE SCREEN
620 POKE 559,0:? #6;"K":SETCOLOR 1,3,8:SETCOLOR 0,9,12:SETCOLOR 3,4,10:EL=1
630 DL=PEEK(560)+PEEK(561)*256:POKE DL+24,7:POKE DL+8,7
640 ? #6;" qqqqqqqqqqqqqqqqqq ";
650 ? #6;"qq                qq";
660 ? #6;"q   DOCTOR BORI&/  q";
670 ? #6;"q                  q";
680 ? #6;"q  boris...*       q";
690 ? #6;"q                  q";
700 ? #6;"q  brick...q       q";
710 ? #6;"q                  q";
720 ? #6;"q   bomb...+       q";
730 ? #6;"q                  q";
740 ? #6;"q meanie...?       q";
750 ? #6;"q                  q";
```




```
760 ? #6;"q   weed...z        q";
770 ? #6;"q           x       q";
780 ? #6;"q                   q";
790 ? #6;"q  skull...h        q";
800 ? #6;"qz          h      zq";
810 ? #6;"qxzZz           ZzZxq";
820 ? #6;"qqxxxpress firexxxqq";
830 ? #6;" qqqqqqqqqqqqqqqqqq ";:POKE
559,42
840 SOUND 1,254,10,2:SOUND 0,255,10,2:
POKE 710,PEEK(20):IF STRIG(0)=1 THEN 8
40
850 ? #6;"K":POSITION 0,0:SOUND 0,0,0,
0:SOUND 1,0,0,0:SETCOLOR 2,1,12
860 RETURN
870 REM  GAME OVER
880 IF A=11 THEN X=X-1:POSITION X,Y:?
#6;"*q"
890 IF A=7 THEN X=X+1:POSITION X-1,Y:?
 #6;"q*"
900 IF A=13 THEN Y=Y+1:POSITION X,Y:?
#6;"*":POSITION X,Y-1:? #6;"q"
910 IF A=14 THEN Y=Y-1:POSITION X,Y:?
#6;"*":POSITION X,Y+1:? #6;"q"
920 POSITION BX(B),BY(B):? #6;"-"
930 FOR T=15 TO 0 STEP -0.2:SOUND 1,10
,8,T:SETCOLOR 4,T,T:NEXT T:TRAP 930
940 LV=LV-1:IF LV>0 THEN GOTO 50
950 POKE 53248,0:GRAPHICS 18:POKE 756,
CHS/256:POSITION 6,5:? #6;"game over"
960 POSITION 0,7:? #6;"     SCORE,";SC
;
970 IF STRIG(0)=1 THEN 970
980 LV=3:SC=0:LL=0:GRAPHICS 17:POKE 75
6,CHS/256:GOSUB 620:GOSUB 580:GOTO 120
990 REM  REDEFINE CHARACTERS
1000 POKE 77,0:DIM CH$(53):CH$="ZX+QJH
!=#%&'@()(*-/?^PFUDWNAMKOCTRBISLEV0123
456789YG,"
1010 CHS=(PEEK(106)-48)*256:CHO=57344
1020 FOR I=1 TO 53:CHP=CHS+(ASC(CH$(I)
)-32)*8:FOR J=0 TO 7:READ A:POKE CHP+J
,A:NEXT J:NEXT I
1030 FOR I=32 TO 39:POKE CHS+I,255-PEE
K(CHO+I):NEXT I:POKE 756,CHS/256:RETUR
N
1040 DATA 16,84,84,170,170,84,40,16,16
,20,24,80,48,16,40,16
1050 DATA 66,231,110,28,56,118,231,66
1060 DATA 223,223,223,0,251,251,251,0
1070 DATA 56,124,214,146,186,238,68,84
,56,146,198,40,16,40,198,130
1080 DATA 0,24,24,24,24,24,8,0
1090 DATA 0,60,12,60,48,48,60,0
1100 DATA 0,60,12,12,60,12,60,0
1110 DATA 0,48,48,32,40,60,8,0
1120 DATA 0,60,48,60,12,12,60,0
1130 DATA 0,60,32,32,60,52,60,0
1140 DATA 0,60,12,12,12,12,12,0
1150 DATA 0,60,44,60,44,44,60,0
1160 DATA 0,60,36,36,60,12,12,0
1170 DATA 0,110,106,106,106,110,46,0
1180 DATA 126,153,36,153,126,36,36,102
1190 DATA 0,16,146,84,0,84,146,16
1200 DATA 0,24,24,24,24,0,24,0
1210 DATA 189,90,165,219,255,195,102,6
0
1220 DATA 255,128,0,0,0,128,255,0
1230 DATA 126,99,99,126,112,112,112,0
1240 DATA 127,96,96,124,112,112,112,0
1250 DATA 99,99,99,115,115,127,62,0
1260 DATA 126,99,97,113,113,115,126,0
1270 DATA 115,115,99,107,127,119,99,0
1280 DATA 99,115,123,111,103,115,115,0
1290 DATA 28,54,99,99,127,115,115,0
1300 DATA 99,119,127,107,99,115,115,0
1310 DATA 99,102,108,120,124,118,115,0
1320 DATA 62,115,115,115,115,123,62,0
1330 DATA 62,115,112,112,113,123,62,0
1340 DATA 127,24,24,24,28,28,28,0
1350 DATA 126,99,99,126,124,118,115,0
1360 DATA 126,99,99,126,115,115,126,0
1370 DATA 127,24,24,28,28,28,127,0
1380 DATA 62,115,112,62,7,103,62,0
1390 DATA 96,96,96,112,112,112,127,0
1400 DATA 127,96,96,124,112,112,127,0
1410 DATA 67,99,102,118,60,60,24,0
1420 DATA 62,115,103,111,123,115,62,0
1430 DATA 28,60,124,28,28,28,127,0,62,
127,102,12,24,63,127,0
1440 DATA 62,127,7,30,7,127,62,0,6,14,
30,54,127,127,6,0
1450 DATA 127,127,96,126,7,127,62,0,30
,63,112,126,115,115,62,0
1460 DATA 127,127,7,14,28,56,56,0
1470 DATA 62,127,99,62,99,127,62,0,62,
127,99,63,14,28,56,0
1480 DATA 124,254,190,190,190,206,124,
0
1490 DATA 62,115,96,96,103,126,62,0
1500 DATA 0,0,24,0,0,24,0,0
1510 REM  THE END
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	3338	20	3987	30	3380
40	22300	50	1614	60	7941
70	9387	80	9558	90	14284
100	1498	110	7071	120	10224
130	5720	140	7507	150	7240
160	11645	170	14830	180	15014
190	18893	200	17308	210	12050
220	7741	230	7260	240	5275
250	4375	260	8933	270	1623
280	6694	290	20121	300	2191
310	10964	320	18643	330	6733
340	15110	350	11991	360	9376
370	20742	380	21405	390	7519
400	9326	410	2345	420	7599
430	6713	440	7840	450	2730
460	7371	470	7647	480	11715
490	11714	500	2324	510	7296
520	11287	530	17112	540	20801
550	2324	560	1614	570	9521
580	4515	590	6533	600	19300
610	11784	620	13127	630	9155
640	7504	650	3859	660	9787
670	3454	680	6675	690	3454
700	6874	710	3454	720	6381
730	3454	740	7677	750	3454
760	6687	770	3806	780	3454
790	7438	800	4704	810	6366
820	7646	830	9509	840	13178
850	11552	860	1498	870	7027
880	7452	890	7728	900	12039
910	12038	920	5102	930	12593
940	5584	950	14024	960	6205
970	3769	980	13595	990	12861
1000	14997	1010	5567	1020	15813
1030	13453	1040	8384	1050	4995
1060	4913	1070	9361	1080	3966
1090	4106	1100	4042	1110	3999
1120	4082	1130	4060	1140	4025
1150	4094	1160	4062	1170	4815
1180	5214	1190	4441	1200	3950
1210	5507	1220	4390	1230	5006
1240	4981	1250	4799	1260	4999
1270	5059	1280	5138	1290	4793
1300	5023	1310	5144	1320	4963
1330	4937	1340	4440	1350	5029
1360	5030	1370	4696	1380	4638
1390	4882	1400	4991	1410	4711
1420	4935	1430	8412	1440	7637
1450	8675	1460	4457	1470	8261
1480	5427	1490	4761	1500	3388
1510	5480				

SPECIAL FX

In the fourth part of his series on amazing effects RICHARD VANNER takes a look at the use of load memory scan.

IN the last few months we have been looking at some features of the DLI (Display List Interrupt), and you should now have an insight about how this part of the computer works.

This month let's consider another function of the display list, the LMS (Load Memory Scan). This is a complicated routine but if used correctly it can create some very useful effects quickly and without a lot of programming. Its main job is to tell the Antic chip where to get data from when displaying the screen information for any mode.

Any line on the screen can have this option set, and so allow screen data to be accessed from any place in memory and in any order.

The importance and use of such a feature may not be apparent at first but it is in fact a very powerfull command.

An example display list is shown in Figure I. It is only a very small display list, but from it you can see the way in which the LMS works.

To start with, the first three bytes are blank lines to bring the start of the screen down to ensure that the first line of screen data is displayed on all TVs and monitors. The next byte describes the type of mode to use for the next line – in this case Antic Mode 2 (Graphics 0). It also has the LMS bit set, and this is essential for the first line in a display list so Antic knows where screen data starts from.

Following this byte is a word address which Antic uses as a pointer from where screen data must be received. This could, for example, be an area in page six where a title is stored. Setting a mode line with LMS followed by the low and high bytes of $0600 would result in data being displayed.

The final command, 65, tells Antic that the display list has ended and it must wait for vertical blanking before restarting a display list.

The address following 65 is the start address of the display list. This is ignored during normal operation of the Atari but is read when a printer is being used. Don't worry too much about this but always make sure you finish a display list with these bytes.

Before we go any further, type in Program I and run it. You will find that the top line of your screen has been re-displayed many times. This is achieved by making a new display list that keeps repeating the LMS on every line, with the same address for the screen data.

What use is it, I hear you ask. Well imagine a game with split screens – player one at the top part and player two at the bottom. These screens could scroll around memory independent of each other giving a wider scope for game design. Many programmers have used this technique in games, and an excellent example can be seen in Synapse's Shadow World.

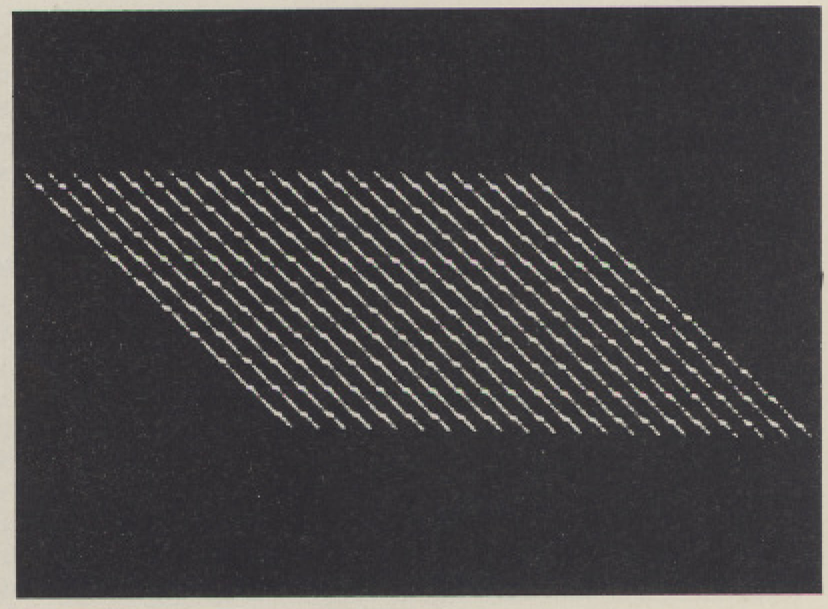
Let's now move on to another example of the LMS with Program II. This listing inverts a Graphics 0 screen, so when you run it everything goes upside down. Try LISTing the program to test the effects.

Again this is all due to the LMS function. The new display list this time creates LMS addresses that start from the base of the screen and work backwards, creating a reversed memory format. The program also changes the character mode register to display upside down characters.

A useless program you might say, but this idea can be used to invert a Mode 8 screen, and this brings us on to Program III. Again the display list is re-designed for a backward memory format, but in this mode the picture on screen becomes flipped over. Notice how the program switches between

Command	Description
112	Blank line
112	Blank line
112	Blank line
66	Graphics mode 0 (Antic Mode 2) with LMS (2+64)
LOW	Low byte of screen memory
HIGH	High byte of screen memory
65	Wait for VBLANK
LOWD	Low byte of display list address
HIGHD	High byte of display list

Figure I: An example display list



A normal GR.8 screen

PROGRAM BREAKDOWNS

Program I

100-115	Sets up screen and memory pointer
120-140	Finds the display list address
141-190	Pokes the new display list into page six
192-220	Pokes in the mandatory end bytes of the display list
230	Tells Antic the address of the newly created display list
240	Prints a small message

Program III

95	Lowers memory so that new display list can be stored in a safe place and so that it won't cross a 1k boundary
100-110	Sets up hi-res mode and draws a patterns
120-140	Sets up display list pointers
141-190	Creates new display list for inverted screen
200-224	Pokes end bytes in
230-240	Switches to new display list and pauses
250-260	Switches back to original display list and pauses
270	Loops back to keep switching

Program II

100-140	Sets up screen, set pointer and find display list
141-190	Pokes new display list with backward format
200-230	Pokes in end bytes and tells Antic the address of the new backward display list
240	Sets character mode register for upside down characters.
250	Prints a backward message.

Program IV

95	Reserves memory
100-102	Sets up Graphics 8
104-110	Draws diagonal lines
120-140	Sets display list pointers
141-195	Creates display list with varying levels of depth
200-224	Sets end bytes,
230	Switches to new display list

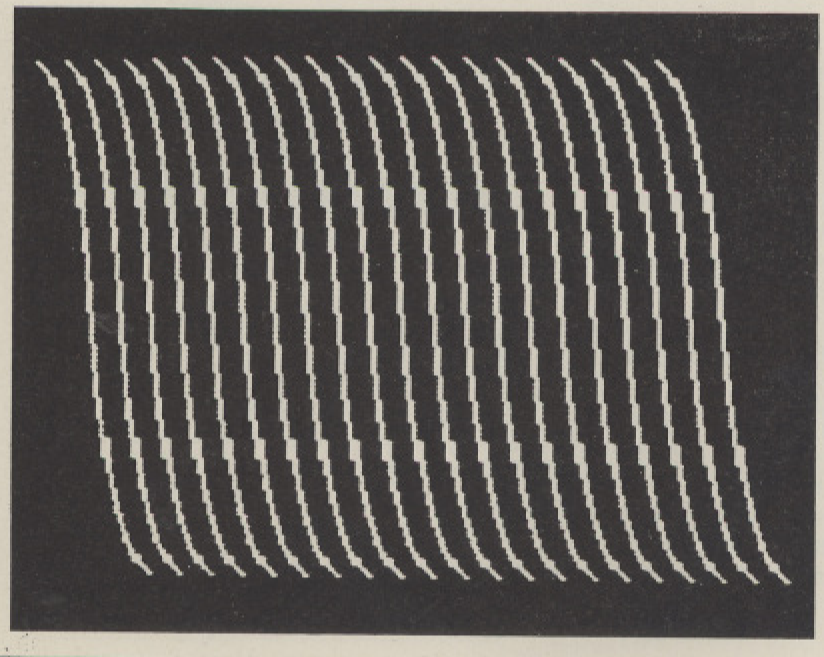
the two display lists at such a quick rate – much faster than moving the actual screen data. You may also find that when the screen changes there is a small flicker. This cannot be helped in Basic but a vertical blank interrupt would solve the problem.

Now on to the final listing, Program IV, which unlocks the hidden secrets of Colourspace. If you have ever seen this program you may have wondered how the curve modes are generated. Well it's all down to the LMS, which this time causes screen data to be displayed in varying steps.

The program sets up a display list that produces the same lines at increasing lengths giving them a curved effect.

The LMS is very important in the display list design and is quite a difficult subject, but even if you don't understand the theory you can use the useful routines from these programs in your own.

One final warning. Make sure that your display list never crosses a 1k boundary and that screen data never crosses a 4k boundary or else rubbish will be displayed.



The effect created by Program IV

Program I

```
10 REM *****************
20 REM *    PROG 1     *
30 REM * SPECIAL FX #4 *
40 REM *      by       *
50 REM *   R.Vanner    *
60 REM *  Atari User   *
70 REM * Messing with  *
80 REM *     LMS!      *
90 REM *****************
100 GRAPHICS 0
110 SETCOLOR 2,0,0
115 PAGE6=1536
120 DL=PEEK(560)+PEEK(561)*256
130 LOWLMS=PEEK(DL+4)
140 HILMS=PEEK(DL+5)
141 POKE PAGE6,112:POKE PAGE6+1,112:PO
KE PAGE6+2,112
150 A=3
160 POKE PAGE6+A,2+64:A=A+1
170 POKE PAGE6+A,LOWLMS:A=A+1
180 POKE PAGE6+A,HILMS:A=A+1
190 IF A<>51 THEN GOTO 160
192 POKE PAGE6+A,2:POKE PAGE6+A+1,2:PO
KE PAGE6+A+2,2:A=A+3
200 POKE PAGE6+A,65
210 POKE PAGE6+A+1,0
220 POKE PAGE6+A+2,6
230 POKE 560,0:POKE 561,6
240 POSITION 0,0:? " Move the cursor u
p here for a suprise!"
```

◄ From Page 39

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	2887	20	2899	30	3621
40	2991	50	3939	60	4169
70	4783	80	2869	90	2887
100	2039	110	2730	115	1860
120	4453	130	3501	140	3163
141	8923	150	549	160	4231
170	5080	180	4838	190	3705
192	10148	200	2924	210	2982
220	2999	230	3786	240	14278

Program II

```
10 REM *****************
20 REM *    PROG 2     *
30 REM * SPECIAL FX #4 *
40 REM *      by       *
50 REM *   R.Vanner    *
60 REM *  Atari User   *
70 REM *               *
80 REM * 'UPSIDE-DOWN' *
90 REM *****************
100 GRAPHICS 0
110 SETCOLOR 2,0,0
115 PAGE6=1536
120 DL=PEEK(560)+PEEK(561)*256
130 LOWLMS=PEEK(DL+4)
140 HILMS=PEEK(DL+5)
141 POKE PAGE6,112:POKE PAGE6+1,112:PO
KE PAGE6+2,112
150 A=3:LINES=23
152 MEM=LOWLMS+(HILMS*256)
154 MEM=MEM+(LINES*40)
156 HILMS2=INT(MEM/256)
158 LOWLMS2=MEM-(HILMS2*256)
160 POKE PAGE6+A,2+64:A=A+1
170 POKE PAGE6+A,LOWLMS2:A=A+1
180 POKE PAGE6+A,HILMS2:A=A+1
185 LINES=LINES-1
190 IF A<>75 THEN GOTO 152
200 POKE PAGE6+A,65
210 POKE PAGE6+A+1,0
220 POKE PAGE6+A+2,6
230 POKE 560,0:POKE 561,6
240 POKE 755,4
250 ? "? NWOD EDISPU .V.T EHT DENRUT O
HW YAH"
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	2887	20	2900	30	3621
40	2991	50	3939	60	4169
70	2437	80	3878	90	2887
100	2039	110	2730	115	1860
120	4453	130	3501	140	3163
141	8923	150	2300	152	4313
154	3425	156	3915	158	4809
160	4231	170	5256	180	4894
185	2741	190	3731	200	2924
210	2982	220	2999	230	3786
240	1859	250	8005		

Program III

```
10 REM *******************
20 REM *     PROG 3      *
30 REM *  SPECIAL FX #4  *
40 REM *       by        *
50 REM *    R.Vanner     *
60 REM *   Atari User    *
70 REM *                 *
80 REM *INVERT GRAPHICS 8*
90 REM *******************
95 MEMRY=PEEK(106)-16:POKE 106,MEMRY:M
EMRY=MEMRY*256
100 GRAPHICS 8+16
102 COLOR 1
104 FOR A=0 TO 191 STEP 5
106 PLOT 0,A:DRAWTO A,191
108 NEXT A
110 SETCOLOR 2,0,0
120 DL1=PEEK(560)
122 DL2=PEEK(561):DL=DL1+DL2*256
130 LOWLMS=PEEK(DL+4)
140 HILMS=PEEK(DL+5)
141 POKE MEMRY,112:POKE MEMRY+1,112:PO
KE MEMRY+2,112
150 A=3:LINES=191
152 MEM=LOWLMS+(HILMS*256)
154 MEM=MEM+(LINES*40)
156 HILMS2=INT(MEM/256)
158 LOWLMS2=MEM-(HILMS2*256)
160 POKE MEMRY+A,15+64:A=A+1
170 POKE MEMRY+A,LOWLMS2:A=A+1
180 POKE MEMRY+A,HILMS2:A=A+1
185 LINES=LINES-1
190 IF LINES>-1 THEN GOTO 152
200 POKE MEMRY+A,65
210 POKE MEMRY+A+1,DL1
220 POKE MEMRY+A+2,HILMS2
222 POKE DL+199,0
224 POKE DL+200,PEEK(106)
230 POKE 560,0:POKE 561,PEEK(106)
240 FOR A=0 TO 100:NEXT A
250 POKE 560,DL1:POKE 561,DL2
260 FOR A=0 TO 100:NEXT A
270 GOTO 230
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	3181	20	3348	30	3986
40	3390	50	4033	60	4352
70	2681	80	4573	90	3181
95	9777	100	2496	102	1395
104	3803	106	4075	108	1329
110	2730	120	2291	122	5053
130	3501	140	3163	141	9328
150	2512	152	4313	154	3425
156	3915	158	4809	160	4574
170	5386	180	5024	185	2741
190	4758	200	3054	210	3576
220	4256	222	2382	224	3744
230	5399	240	3853	250	4600
260	3853	270	1619		

Program IV

```
10 REM *******************
20 REM *     PROG 4      *
30 REM *  SPECIAL FX #4  *
40 REM *       by        *
50 REM *    R.Vanner     *
60 REM *   Atari User    *
70 REM *                 *
80 REM * 'CURLING LINES' *
90 REM *******************
95 MEMRY=PEEK(106)-16:POKE 106 MEMRY:M
EMRY=MEMRY*256
100 GRAPHICS 8+16
102 COLOR 1
104 FOR A=0 TO 209 STEP 10
106 PLOT A,0:DRAWTO A+110,100
108 NEXT A
110 SETCOLOR 2,0,0
120 DL1=PEEK(560)
122 DL2=PEEK(561):DL=DL1+DL2*256
130 LOWLMS=PEEK(DL+4)
140 HILMS=PEEK(DL+5)
141 POKE MEMRY,112:POKE MEMRY+1,112:PO
KE MEMRY+2,112
150 A=3:LINES=40
151 FOR LOOP=0 TO LINES-1:READ SIZE
152 FOR LOOP2=1 TO SIZE
153 MEM=LOWLMS+(HILMS*256)
154 MEM=MEM+(LOOP*40)
156 HILMS2=INT(MEM/256)
158 LOWLMS2=MEM-(HILMS2*256)
160 POKE MEMRY+A,15+64:A=A+1
170 POKE MEMRY+A,LOWLMS2:A=A+1
180 POKE MEMRY+A,HILMS2:A=A+1
182 NEXT LOOP2
185 NEXT LOOP
190 DATA 1,1,1,1,2,2,2,3,3,3,4,4,5,5,6
,6,7,8,9,10
195 DATA 10,9,8,7,6,6,5,5,4,4,3,3,3,2,
2,2,1,1,1,1
200 POKE MEMRY+A,65
210 POKE MEMRY+A+1,DL1
220 POKE MEMRY+A+2,HILMS2
222 POKE DL+199,0
224 POKE DL+200,PEEK(106)
230 POKE 560,0:POKE 561,PEEK(106)
240 GOTO 240
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	3181	20	3350	30	3986
40	3390	50	4033	60	4352
70	2681	80	4392	90	3181
95	9777	100	2496	102	1395
104	3946	106	4643	108	1329
110	2730	120	2291	122	5053
130	3501	140	3163	141	9328
150	2295	151	6192	152	4046
153	4313	154	3096	156	3915
158	4809	160	4574	170	5386
180	5024	182	2354	185	2304
190	6793	195	6812	200	3054
210	3576	220	4256	222	2382
224	3744	230	5399	240	1622

SOFTWARE *Solutions*

Your programming problems solved by ANDRÉ WILLEY

Trapped by a loop

WE'VE got a really mixed bunch of questions this month – one of which had me a little puzzled for a time. Don't forget that this is *your* forum – so keep those questions coming in on any aspect of Atari programming.

Let's start the ball rolling with a letter from **Jim Colley** from Whirlow in Sheffield. He writes:

"I would appreciate your advice on a problem I am having with my Atari. In fact, what I really want to know is whether or not I have a fault in my machine.

I am using a 130XE, O.S.S's Basic/XE cartridge, two 1050 disc drives and two printers – a 1029 and a 1020, neither of which are turned on at the same time.

My problem concerns the TRAP statement. I find that when I use it from inside a loop to direct the program back within the loop I get Error 13 – NEXT without FOR. However I have only found it to happen when using GOSUB – for example:

```
10 FOR F = 1 TO 10
20 TRAP 30: GOSUB 1000
30 PRINT F
40 NEXT F
```

I would have expected that when the program attempts to branch to the non-existent line 1000 that the TRAP would bring it back to the loop and execution would continue. But it gives the error 13 when plainly there is a FOR statement. None of the manuals comment upon this so I am wondering whether there is a bug in my rom. I hope that you might be able to set my mind at rest."

The problem you have encountered is not a bug as such, merely a slight misunderstanding of the way Atari Basic functions.

When a FOR statement is encountered the program stores the details of the loop by pushing them onto a special run-time stack. This is simply a place in memory where numbers can be placed one at a time and then retrieved afterwards. Think of it like a pile of letters on a desk: Whenever you add a new letter to the stack you always place it on the top of the pile, and whenever you take any off again you always start with the one on the top.

This is known as a first-in-last-out (or FILO) stack because the first item you put on the stack will be on the bottom of the pile and hence be the last to come out again. Incidentally, some computer operations will use (first-in-first-out) stacks which work the other way – rather like pulling the letters from the bottom of the pile and dealing with the oldest first and the most recent ones last.

Anyway, to get back to the point, Basic uses it's run-time stack to keep track of where to go back to for FOR ... NEXT loops and GOSUB ... RETURN branches. Therein lies your problem. So let's look at what Basic does during your program:

Line 10 is a FOR statement, so it pushes all the information it requires onto the stack and goes on to the next line.

Ignoring line 20 for a moment, line 30 prints out the value of F and then line 40 pulls the FOR details back off the stack and thus returns to line 10.

Now, when you add line 20 the follows sequence of events takes place:

The TRAP line is set to 30, but no action is taken on it at this point. Then the program comes across a GOSUB statement, so it pushes the calling line number details (line 20 in this case) onto the stack and goes off to find line 1000.

At this point the error handler cuts in because there is no line 1000 to go to. It detects this error (Error 12) and also notices that a TRAP has been set to line 30 – so instead of printing an error message it branches and continues execution at line 30 (PRINT F).

Line 40 is a NEXT statement, so it tries to pull the information about the associated FOR command from the stack – and what does it find but the unused reference to the RETURN address for the non-existent GOSUB. Of course, it can't know that the next item on the stack is the one it wants, so it gives up and produces an error.

Now for the solution: All you need to do is remove the RETURN address entry from the stack before you get to the NEXT statement. The POP command will do this, so if you change line 30 to:

30 POP: PRINT F

your program will run as required. Don't forget to remove the POP statement if you decide to use the GOSUB to line 1000 because if the stack is already in order when you POP it then you'll remove the perfectly valid FOR reference and you'll get the same error!

Oh, and by the way – you CAN attach two printers at the same time, but be careful if you are trying to use a word processor or other similar program. The normal printer reference used by most software is "P:" or "P1:", either of which will drive any

Turn to Page 42 ▶

SOFTWARE Solutions

◄ *From Page 41*

printer on the serial bus. However, most Atari printers also have a unique device ID number built into their rom chips. An 850 interface, for example, will also respond to "P2:", and each new Atari printer has its own code ("P3:", "P4:", and so on). I don't know the code for a 1020 off hand, but the 1029 responds to "P6:"

This is obviously only useful with programs which allow the use of printer ID numbers (so Atariwriter is out, for example), and it also only works with the XL/XE operating system.

Disc's density

A.W. Crawford of **St. James's Gardens, Penicuik** has two questions:

Is there any way of checking, in machine language, the density in which a 1050 drive is operating? At the moment the technique I am using involves trying to read a sector outside the single density range, say 1000, and assuming that an error indicates single density, which isn't a particularly elegant technique. Is there a tidier way, perhaps one that involves interrogating the drive controller?

Also, to settle an argument, what is the clock speed of a PAL Atari? Mapping the Atari says that PAL Ataris run at 2.217 Mhz, as against the 1.79 Mhz of NTSC machines. Since the 1.79 Mhz rate was chosen to give two colour clocks on the display per cycle, and PAL has a greater number of scan lines, I can see the reasoning behind this statement. However, the Hardware Manual, while documenting many of the differences between PAL and NTSC machines, does not mention a change in the clock speed. Which is the correct figure?

Well, the standard 1050 drive doesn't seem to have any register available from the Status call to indicate the density of the disc. It's density sensing mechanism would seem to be totally internal and transparent to the user. It doesn't even support the $4E and $4F SIO commands used to configure the access mode on true double density drives.

However, all is not lost. The US Doubler chip, designed to give you faster disc access and true double density on a 1050 DOES have the capability you require. These cost about £29.95, and are available from Frontier Software or your local dealer.

The US Doubler returns far more information via the Status request command ($53) than a normal 1050. This data is placed into the four bytes starting at $2EA, and is mapped as shown in Figure I. In addition the US Doubler also provides the full $4E and $4F modes, plus some additional fast formatting commands.

$2EA	**Bit 0**	BUSY (Normally 1)
	Bit 1	DRQ (Normally 1)
	Bit 2	LOST DATA (Normally 1)
	Bit 3	CRC ERROR (1=Okay, 0=Read error on last sector)
	Bit 4	SECTOR NOT FOUND (0=Last sector read was not found)
	Bit 5	RECORD TYPE (Special write command used on last sector)
	Bit 6	WRITE PROTECT (0=Disc was write protected)
	Bit 7	NOT READY (0=Drive door still open)
$2EB	**Bit 0**	COMMAND FRAME (1=Error in last command frame) *
	Bit 1	CHECKSUM (1=Error in last checksum data) *
	Bit 2	OPERATION (1=Operation error, for example bad sector) *
	Bit 3	WRITE PROTECT (1=Disc is currently write protected)
	Bit 4	MOTOR ON (1=Disc spinning)
	Bit 5	SIZE (1=256 byte sectors, 0=128 byte sectors)
	Bit 6	Unused
	Bit 7	1050 DD MODE (1=Dual Density (1050) mode)
$2EC		DRIVE TIMEOUT VALUE (50ths of a second)
$2ED		Unused (Always 0)

* *Not used with the US Doubler.*

Figure I – Status bytes returned by a US Doubler drive

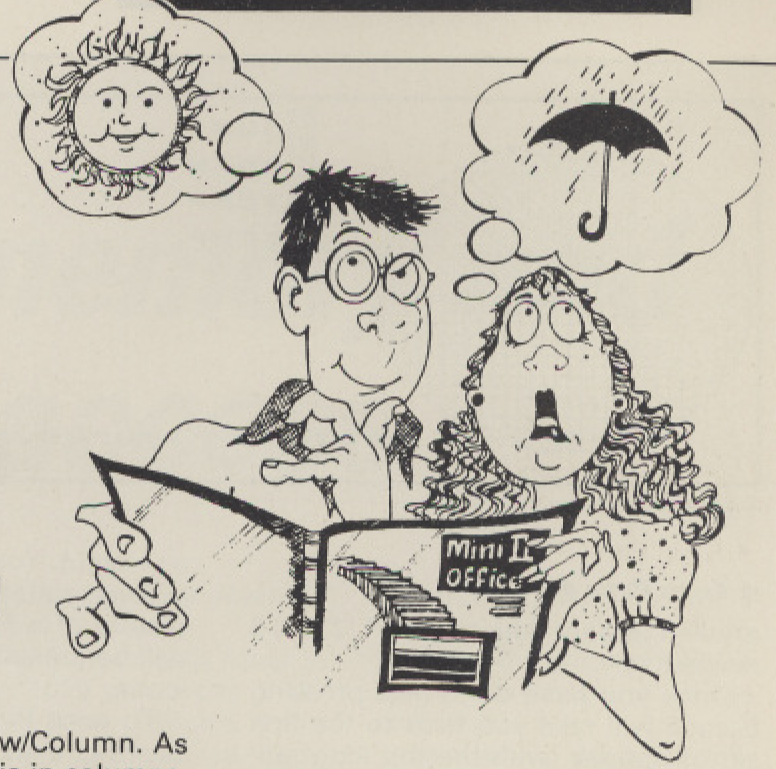
As far as the clock speed of a PAL Atari computer goes, you are quite correct in your assumption that our machines run at 2.217 Mhz. In fact, the crystal which governs the speed of both British and American machines runs at exactly 3 Mhz, but the amount of cycles stolen by ANTIC and GTIA during their DMA access to the screen varies depending on the television system in use at the time.

A PAL picture is made up of 50 frames per second, each being some 312 lines deep. An NTSC picture, on the other hand, is made up of 60 frames of 262 lines each second. This accounts for the difference in stolen clock cycles, and hence the variation of the two CPU speeds.

● *That's all we've got room for this issue, but there'll be more of your technical and programming questions next month.*

Are you having problems getting your programs to work? Write to Software Solutions, Atari User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

We will answer as many as we can within the pages of *Atari User* but, unfortunately we cannot give personal replies.



A sort of iso-bar chart

ANDY DORAN uses Mini Office II to chart our wonderful weather

LAST month we set up a spreadsheet containing lots of data about the weather. It would be nice to see the fruits of our labour pictorially, and this is the task for which the graphics program was written.

Let's take the data you've already entered into the Spreadsheet and display it graphically in preparation for a report or holiday brochure.

Before doing this it's a good idea to obtain a printout of the spreadsheet. This will make the collation of the graphics data much more simple, and is shown in Figure I.

A number of sets of data could be used to create the graphics. For instance, it would be interesting to see the average, best and worst results in each category compared.

Looking at the printout, we can see that the columns that contain these items of data are I, J and K. The titles for each value appear in column A. This is all the information we need to save data ready to load into the graphics program.

After selecting the option to save graphics data, the first question that is asked is Select from Row/Column. As we have seen, the data is in columns, so enter C. You are then asked for the column in which the headings appear, so type A in answer to this question. Finally, you are asked to give the column in which the data is stored – column I.

Once you have answered these questions you will be presented with the values in individual cells, the cell number (I1) and the contents of that cell.

You have to state whether or not this cell is required by answering Y or N. Answer N for cell I1 and Y for cells I2 to I5 and then press Return. Finally you are asked for the filename in the same way as when you saved the spreadsheet. Enter the filename as AVERAGE.GRA.

Repeat the process for the two columns BEST and WORST. Again for easy reference, save these as BEST .GRA (column J) and WORST.GRA (column K).

You can now leave the spreadsheet and move on to the graphics module. Make sure you have the Mini Office II disc in the drive, select the Mini Office II menu and from the next screen choose graphics.

The three sets of data you saved – AVERAGE.GRA, BEST.GRA and WORST.GRA – should be loaded into data sets 1, 2 and 3 respectively. This is achieved by selecting Load Data and then indicating the data set number and giving the filename (make sure that your data disc is in the drive).

Note that when you load data sets 2 and 3 the old filename must first be deleted or edited before the new one is entered.

With the data sets loaded, you can now draw some graphs so let's obtain a bar chart comparing all three sets of data.

Selecting Bar Chart gives a white screen with a set of icons down the right hand side. You need to tell the computer that you wish to use all the data, because if you don't only one set will be used. To do this, select the icon that reads Option (using the cursor keys and Return as we do to select a menu option).

Next, select the Data-icon. This will prompt the computer to ask how many sets are to be used (the question appears near the bottom of the screen). Answer 3, to this question, and then define the primary, second-

Turn to Page 44 ▶

	A............	B......	C......	D......	E......	F......	G......	H......		I......	J......	K......
1		MON	TUE	WED	THUR	FRI	SAT	SUN	1	AVERAGE	BEST	WORST
2	SUN (HOURS)	8	7	7	8	9	8	9	2	8	9	7
3	RAIN (INCHES)	3	2	3	3	1	0	1	3	2	3	0
4	TEMP (BEST)	29	28	27	31	32	28	33	4	30	33	27
5	TEMP (WORST)	24	24	25	26	25	26	27	5	25	27	24

Figure I: A typical week's weather

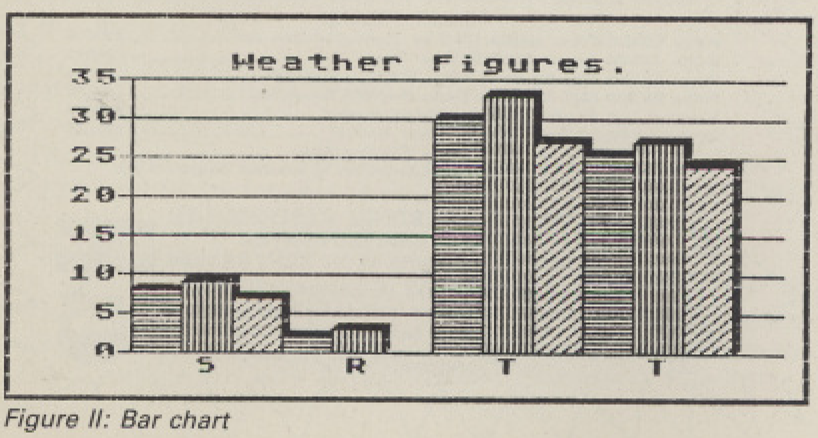


Figure II: Bar chart

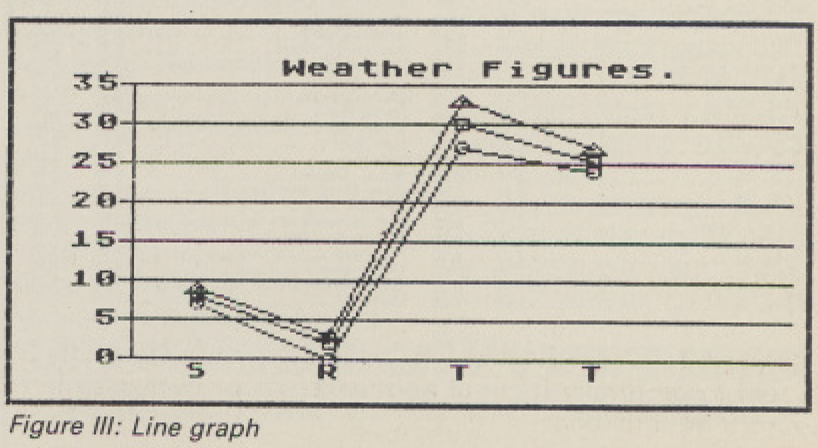


Figure III: Line graph

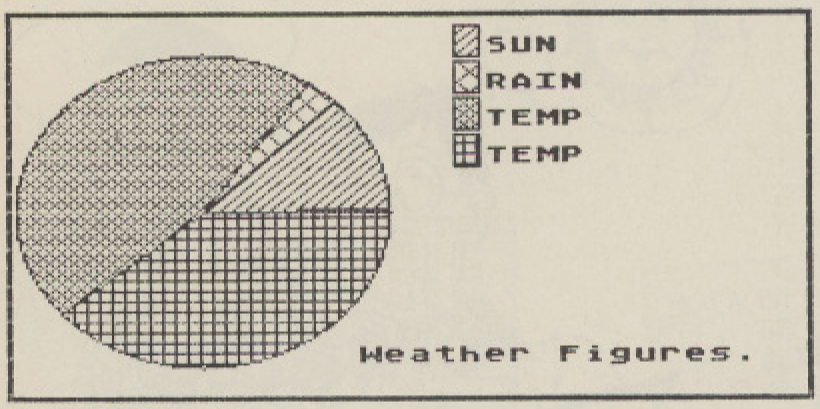


Figure IV: Pie chart

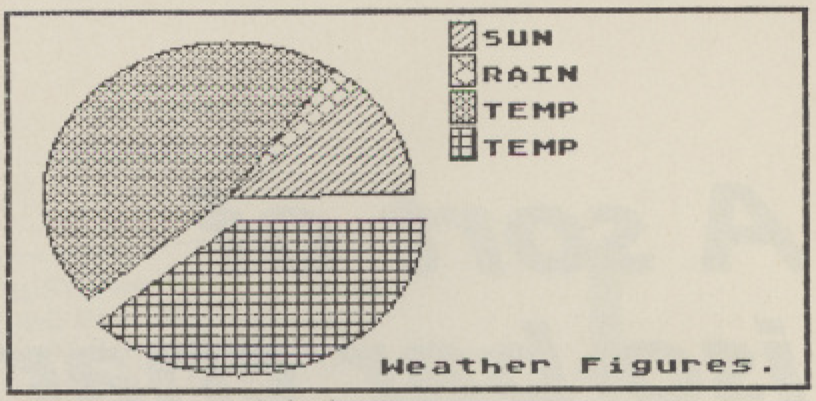


Figure V: Segmented pie chart

◀ ***From Page 43***

ary and tertiary data sets as 1, 2 and 3 respectively.

Once you have done this, pressing Escape will take you back to the first set of options, with the top icon representing a bar chart. Select this, press Return, and the bar chart will be drawn on screen.

Label it by choosing the pen and ink icon and entering the required text. Press Return, and position it by using the cursor keys. Confirm the position with Return.

Now you've got a graphical display of the data, it might be useful to obtain a printout. You do this by selecting the Screen options icon (the one with a picture of a TV screen on it) and you will be presented with a furthur set of icons.

To print the screen, select the one bearing a picture of a printer. The computer will ask whether you want the printout on a printer or to disc – press P to indicate printer.

You now have to answer the question Atari 1029 or Epson by pressing either A for Atari or E for an Epson or Epson compatible printer and once you do this the computer will dump the screen to the printer (see Figure II).

This method can be used to create a line graph like the one shown in Figure III. As the primary, secondary and tertiary data sets have been defined, there's no need to define them again.

Only one set of data is used at any one time but experimenting with the various options produces results like those for the pie chart shown in Figures IV and V.

Now that you have used the graphics program and spreadsheet together once, you should have no problems repeating the process again to create other spreadsheets – perhaps even an accounts spreadsheet with pie charts and bar charts to liven it up bit.

Extra memory and faster access

I RECENTLY bought a 130XE to add to my collection of Atari bits and bobs. This was mainly due to the idea that the extra 64k memory over my 800XL would be really useful for programming purposes.

When it came to using this extra memory the whole process seemed mind bogglingly difficult and the manual seemed almost apologetic about how to use it.

I find that the only use of the memory is the ramdisc facility you get with Dos 2.5. Strangely I have seen very little about this extra memory in magazines, and was wondering if you or your readers could reassure me about it.

Also could you please tell me if you know of any software that will print musical notation onto a 1029 printer as I have searched for such a program and have up to now found none. – **Richard Martin, London.**

● The 128k memory of a 130XE can only be used in sections and not all at the same time from Basic. This means that it can be used for storage space and you can then retrieve the information when you require it.

This allows very fast access to data, and we'll show you how in a future issue of *Atari User*.

You could buy Basic XE which allows you a full 64k block of memory to use for programming and gives you a 38k block for variable workspace.

This comes on a cartridge and can be obtained from several suppliers including OSS (Optomised System Software) for around £70.

We have not seen any software that will print musical notation to an Atari 1029 printer, but if any of our readers can help please write in to Mailbag.

Groaning disc drive

I HAVE read the advertisement in Atari User for Font IV from Datel Electronics, and was wondering if I fitted it to my 1029 printer would it then allow me to use Printshop with it?

I also have a problem with the amount of noise that my 1050 disc drive makes when in use. I have tried using sewing machine oil, but it only helps for a short while.

How can I stop this, as it is very annoying when loading or saving programs? – **Marcel Lammerse, Landmetersweg, The Netherlands.**

● The Font IV chip fitted to Atari 1029 printers is a 16k rom that allows the inclusion of three new character sets as well as retaining the original Atari character set. But it will not make your Atari 1029 work with Printshop.

The idea of using sewing machine oil on your drive to reduce the noise is all right, but you have to be very careful when applying it.

If it comes in contact with areas of the drive other than the arm that carries the drive head you can cause damage – especially if oil gets on the head.

The groaning noise that your drive makes is not actually a fault and if you can put up with it it's best not to go poking around inside your disc drive.

Revision update

MY Atari 800XL computer has a Revision B Basic and I have a cartridge with the Revision C Basic in it.

Is it possible to remove the Revision C chip from the cartridge and replace the chip in my computer with it, and if not could you please explain why? – **H G Angel, Harrogate, North Yorkshire.**

● Providing that your cartridge has a 24 pin 8k rom you should have no problem swapping it with your old Revision B chip.

Atari also issued this cartridge with two 4k roms and if this is the case you will not be able to replace the Basic roms.

But if the cartridge is left plugged in the computer it will disable your old Revision B Basic and replace it with the Revision C on the cartridge.

Basically it replaces the need to desolder your Basic rom from the computer and take your cartridge to pieces.

Squashed up pictures

I TYPED in Kevin Milford's Dump 15 program from the July 1987 issue of Atari User *and find that pictures from the Paint Artist program are compressed into the top half of the screen as they load and are then printed in this way. Is this correct?* – **D J Deeming, Gillingham, Kent.**

● The Dump 15 utility is designed to be used with files created by the Atari TouchTablet and Micropainter programs. Unfortunately Paint files are in a format that the program doesn't interpret correctly, and so can't be printed with this program.

Mission X blues

I TYPED in the Mission X listing from the August 1987 issue of Atari User and found that when I ran the program it came up with enter level(1–3).

I typed in level 1, pressed Return and the screen went blue in the top right corner and then simply did nothing else.

What is the problem? Is

Turn to Page 46 ▶

Protection pleases

I HAVE now obtained a copy of the August 1987 issue of Atari User *and I am glad that I did, as it is the most interesting issue to date.*

The article about protecting programs by Len Golding is very useful, and also of great interest to me are the articles about Mini Office II and the Five Liner joystick device.

The article on the Dos map confirms my opinion that the people who wrote the Atari OS were put in separate rooms and not allowed to talk to each other. How else can all the different numbering systems within the OS be explained?

Keep up the good work supporting the Atari and thanks for giving us non-games players so much to read this time. – **P Boulter, Tyneside.**

◀ From Page 45

there a fault with the listing in the magazine? – **Kevin Wallace, Upton, Wirral.**

● The listing in the magazine is correct and you will find that you made an error as you typed it in. Check your program very carefully, especially any DATA statements, and you should find your error.

It appears to be happening while the computer is setting up the playfield, and this takes place between line 4000 and line 4990, so check these lines especially.

You can use the Get it Right! checksum to help you and full details of how to use it are in the August 1986 issue of *Atari User*.

ATARI USER Mailbag

WE welcome letters from readers – about your experiences using the Atari micros, about tips you would like to pass on to other users . . . and about what you would like to see in future issues.

The address to write to is:

Mailbag Editor
Atari User
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY

Recipe for success

IS it possible to run a word processor system on an Atari with only a disc drive, as I have not got a printer?

I am a chef and have a large selection of recipes and menu sets that I would like to keep a record of. I have a varied selection of databases but none seem adequate for the job.

Eventually I would also like to add a costing system to work out multiple recipe ingredients and was wondering what I would need to do this task.

Also could you or any of your readers please tell me if there is an astrology data program suitable for the 800XL and disc drive system? – **John Upton, Brighton, East Sussex.**

● It is possible for you to enter your recipes into a word processor and store them. The printer is only required when you decide to make a hard copy of a file.

As to adding a costing system, you will find that a spreadsheet package is ideal for this purpose. An ideal package for you to use for both your word processing and for a spreadsheet is Mini Office II, which includes other programs such as a database that maybe of use to you.

Unfortunately we do not know of an astrology program for the 8 bit Ataris, but if any of our readers know of one please then just drop us a line.

Speeding Fast Mover

AFTER typing in the Five Liner program Fast Mover from the September 1987 issue of Atari User I was very disappointed to find it did not work properly. Are there any errors in the listing? – **Ruth James, Heaton Chapel, Stockport.**

● Sorry, there is an error in line 20. The eleventh number – 105 – should be 205.

Doubler difficulty

I OWN an Atari 1050 disc drive with a US Doubler chip installed and it was working perfectly.

Then I attempted to load Graphic Art Department from Databyte and it simply wouldn't load and no error messages appeared. All my other software loads all right, so could you please help me. – **Sarah Keates, Rhode Saint Genese, Belgium.**

● The error may be caused by the protection on the disc. Some forms of protection on discs time the disc access and if this time is not the usual one the program will not load.

Because your doubler chip increases the speed of your drive it will return the wrong time and prevent the load.

Short of a £ or two

AFTER buying Mini Office II I wrote a document and within it I used the pound sign.

When it came to printing the article the pound sign came out on preview mode but when I printed it out on my 1029 printer it came up with a # where my pound sign should have been.

Apart from this I find Mini Office II a superb piece of software, so can you please help me? – **Neil Doherty, Barnsley, South Yorkshire.**

● To be able to print the pound sign on your Atari 1029 printer you must go to the printer setup section of Mini Office and set printer code 7 to the following codes: 27, 23, 8, 27, 24. Then whenever you require the pound sign in your text simply type Control + 7.

Dumping pictures

I OWN an Atari 800XL disc system with 1029 printer and touch tablet with AtariArtist software. Is there any software that will allow me to dump my touch tablet pictures to my 1029 printer?

Could you also tell me if it is possible to attach the Maplin DIY modem kit to my Atari using an Atari 850 interface and Mini Office II. – **Peter Knight, Ashton-Under-Lyne, Lancashire.**

● In the July 1987 issue of *Atari User* you will find a listing called Dump 15 that takes your AtariArtist pictures and dumps them to either an Epson-compatible or Atari 1029 printer.

The Maplin D.I.Y modem kit will work on your computer using an Atari 850 interface box and the Mini Office II communications software.

Unfortunately this modem is only 300 baud, so you could run up quite a sizeable telephone bill when you use it. Also it is not BT approved, so its connection to public telecommunication systems is prohibited.

Missing level

I RECENTLY bought Domark's The Living Daylights after reading your review in the August issue of Atari User.

When I loaded the game I was disappointed to find no title page, and that there were only seven levels to

the game.

This intrigued me very much as you mentioned a title page and eight levels. Could you please explain why my game is different to your review copy? – **Stephen Buxton, Normanby, Cleveland.**

● We reviewed an advance copy sent by Domark and it contained a title screen and level 6. Unfortunately in the release copy of the game the title screen and level six were removed due to memory problems.

Spectrum software

I WAS wondering if there is any device produced that will allow me to use Spectrum software like Barry McGuigan's boxing, Match of the Day or Monopoly on my Atari 800XL and 1010 tape recorder. – **Scott Gallacher, Astley, Leicester.**

● There are no devices available to allow you to use Spectrum software on the Atari, but with the superb software available for the Atari why would you need one?

Keeping in touch

SOME time ago, you were offering Dos 2.5 to your readers. Can you still supply it?

Also could you please tell me if it is possible to print out touch tablet picture files on to the Atari 1020 printer plotter and if so how?

Can the 1020 also be used to imitate a normal printer such as the Atari 1027 letter quality printer? – **R Bawden, Forest Gate, London.**

● Unfortunately we have no more supplies of Dos 2.5 discs, but this does not mean you can no longer obtain one. Various advertisements in *Atari User* still offer Dos 2.5 for £2.

Your 1020 plotter will dump your touch tablet picture files, and in the January 1986 issue of *Atari User* we published a dump program for this printer.

It was a little slow, but did the job. The 1020 can print your listings and work from within your programs, but don't expect it to be able to imitate letter quality as it just isn't capable of it.

Bored by low baud

I ALWAYS read the mailbag section of Atari User and wonder if you can help me with a problem I have with the Atari tape system.

Why do the games take so long to load when other computer systems load so fast? And is it possible to speed the loading time of my games up? – **Andrew Blair, Balornock, Glasgow.**

● The Atari tape system works via the serial port located at the rear of your XL/XE computer or on the side of the old 400/800 computers.

Unfortunately, the system that Atari have used for loading/saving files on the tape uses a slow baud rate (600). It is possible to alter this, and theoretically the input baud can range from 318 to 1407 baud.

To be able to load a program at a higher baud rate it must first be saved using the new baud rate, so you could save your own programs or listings from *Atari User* at a higher speed, but to resave commercial software that is already at the slow rate yourself at a higher speed would infringe copyright.

Although it is not easy to alter the baud rate it is possible because this rate is controlled by a routine called the SIO and this can be altered via software.

The OS uses it to account for different drive motor speeds or stretched tapes, and once a true baud rate is calculated then the hardware is adjusted to suit the load status.

Once the workings of this routine are known it is possible to alter the OS parameters that control the input of the serial port and increase the loading speed.

However it is not possible to explain how this is done within the confines of the letters page due to the complexity of the software required.

Pictures for Palette

I HAVE just created a picture using the Technicolour Dream art program and was wondering how I get it printed in the Palette page of Atari User. Do I send it in on a disc or as a photograph? – **Kevin Campbell, Livingston.**

● Send your pictures in to us on a data disc or tape, stating clearly which utility you used to draw them, your full name and address and a note saying it is your own work and you don't mind us printing them. We will assess them and consider them for publication.

T shirt ribbon

I UNDERSTAND from a friend that it is possible to obtain a printer ribbon which enables designs to be printed on T shirts. My printer is an Epson FX-80, so will the ribbon fit it?

I have spent some time looking through various magazines but can find no reference to it anywhere. Can you please tell me the phone number of the company which sells the ribbon? – **Andrew Godsall, Manchester.**

● The ribbon is designed to work on Epson printers so you will have no problems with it. You can obtain one from MGA Microsystems 05806 4278.

Smudged paper

I HAVE a problem with my printer. Ever since I acquired a new ribbon it has been leaving marks on the paper where the head has been moving.

If I leave the printer for a day or so a large spot of ink appears on the paper underneath the printer head.

I have checked with the manual and the position of the head is correct. Any help would be gratefully received. – **Andrew Smith, Chorleywood, Herts.**

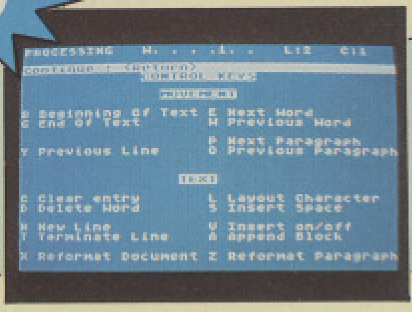
● On most printer heads there is a shield to prevent the ribbon touching the paper. Make sure your ribbon is behind the shield.

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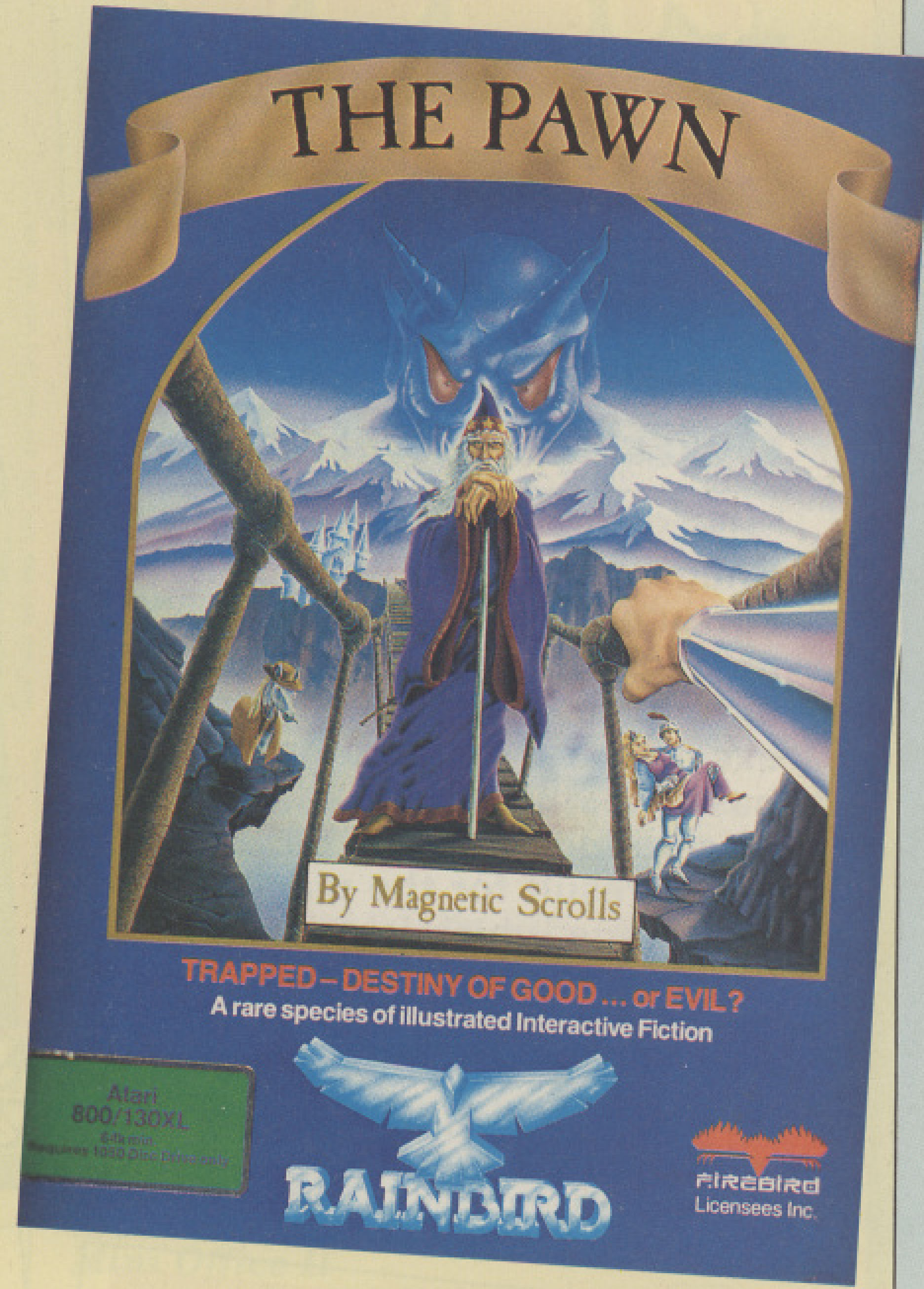
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– Anthony Ginn, writing about the Atari ST version in the May 1986 issue of the Atari User



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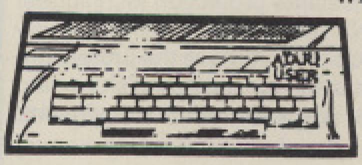
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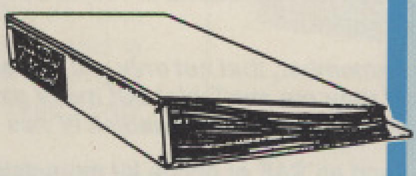
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AT10

The next unit that fits between your Atari and the joystick



Time gentlemen please!

LEN GOLDING shows how your Atari can help fund-raising

HAVE you ever thought of using computer games to raise funds for your favourite charity? Here's a little device which will prove invaluable if you do. It's a joystick extension cable, games timer and computer-hog deterrent all in one.

Our photograph shows the de-luxe version, with flashing lights and a bleeper, but it can be made in much simpler form if you need to keep costs down.

Figure I shows the circuit, which is built around a single IC chip containing four NAND gates. This chip must be one of the new AC series, since only that type has the necessary input and output characteristics.

The time delay is provided by gates A and B, which form a monostable, whose output (pin 8) is connected to the joystick's common pin. Pressing S2 starts the timing period, and sends pin 8 low (0v).

The joystick then behaves normally for the pre-set period when pin 8 goes high (5v) and the joystick stops working. VR1 can adjust the on time from a few seconds up to about five minutes, depending how generous you feel.

Gates C and D are not needed for the basic timer, but they don't cost any extra, so we might as well use them. Figure I shows the two gates wired as an oscillator, which runs at about 0.5 Hz and can pulse an LED or buzzer on and off. Choose a lower value for R3 if you want to speed up the pulse rate or a higher value to slow it down.

S1 is optional and allows you to select one of three states: On without time limit, off or on with preset time limit. If you don't want this facility, just

Turn to Page 54 ▶

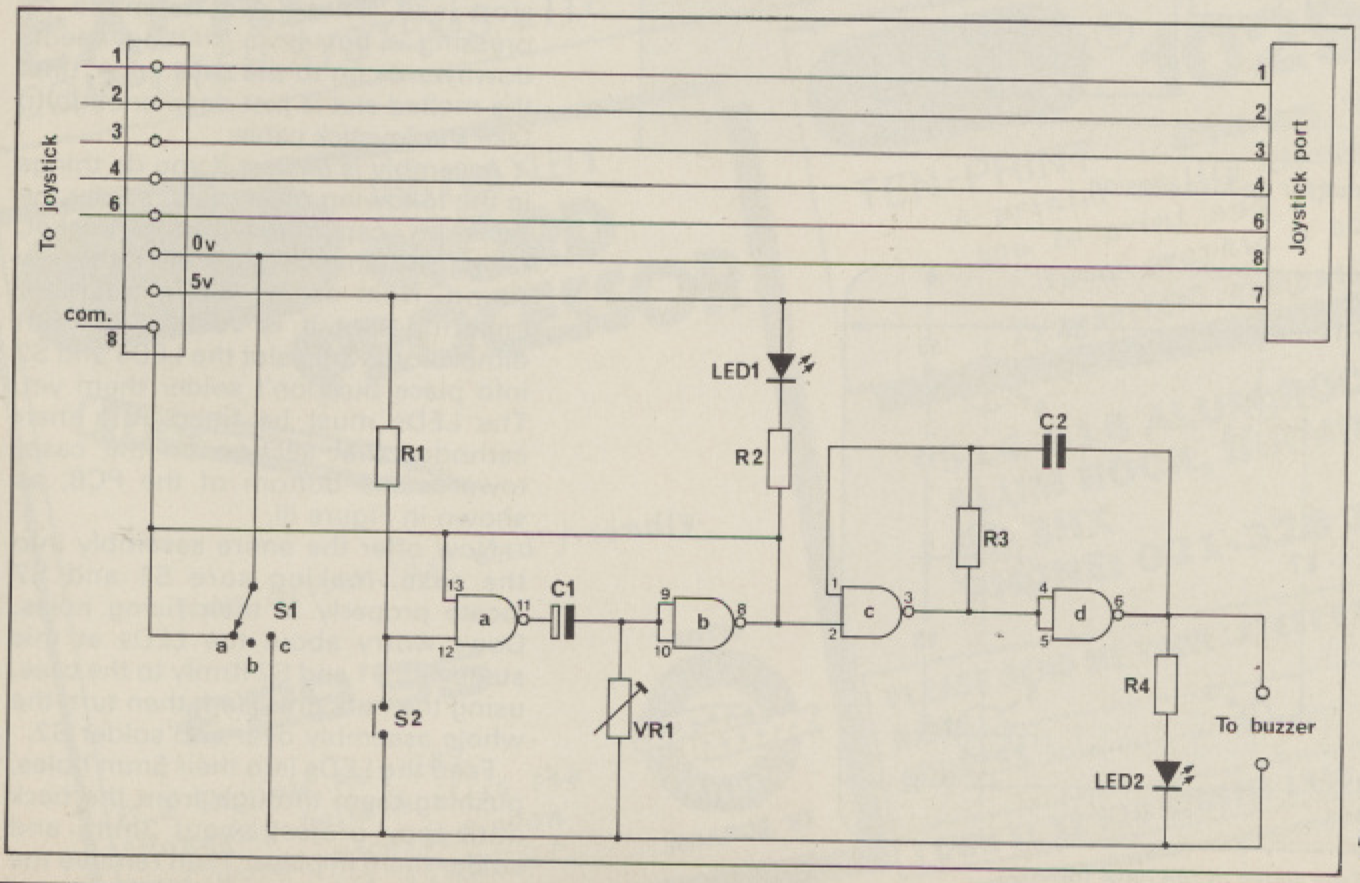


Figure I: The circuit

◀ From Page 53

link points b and c on the PCB. Because the joystick stops working when time is up, you don't strictly need the LEDs or buzzer, but they make the gadget friendlier to use.

Buy a ready-drilled PCB from RH Design, or etch your own using the pattern given in Figure II. Holes for S2 should be 2mm diameter, while those for VR1 and the terminal blocks are 1.1mm.

S1 requires rectangular slots for its pins, so drill three 1.1mm holes at the positions marked in pads a, b and c, then remove the material between them using a craft knife.

A 3mm hole is needed at the point marked X so that you can adjust VR1 from the back of the PCB when it is fixed into its case. All other holes should be 0.8mm.

Component layout for the de-luxe version is shown in Figure III. If you don't require a pulsing light or buzzer, leave out R3, LED2, C2 and the two-pin terminal block. R2 and LED1 are also optional, but it's best to retain them unless cost is of paramount importance. And you can dispense with the terminal blocks if you don't mind soldering wires directly to the PCB tracks.

The board is designed to fit into a Verobox type 301, which is about the cheapest case you can buy. Figure IV shows how to drill the case top, and you will also need holes in the long sides for entry and exit of the extension lead. These can be made by pressing a hot 4mm knitting needle downwards on to the case edge, until the melted slot is just deep enough to take the joystick cable.

Assembly is easiest if you do things in the following order: First solder the resistors, capacitors and IC socket, taking care that C1 goes the right way round. Next solder S1 in position, ensuring that it is vertical in both dimensions, then slot the LEDs and S2 into place but don't solder them yet. The LEDs must be fitted with their cathodes (flat section on the case) towards the bottom of the PCB, as shown in Figure III.

Now offer the entire assembly into the case, making sure S1 and S2 locate properly in their fixing holes. Don't worry about the LEDs at this stage. Fix S1 and S2 firmly to the case, using the nuts provided, then turn the whole assembly over and solder S2.

Feed the LEDs into their 5mm holes, pushing them through from the back until they project about 3mm, and solder them in place. Then remove the

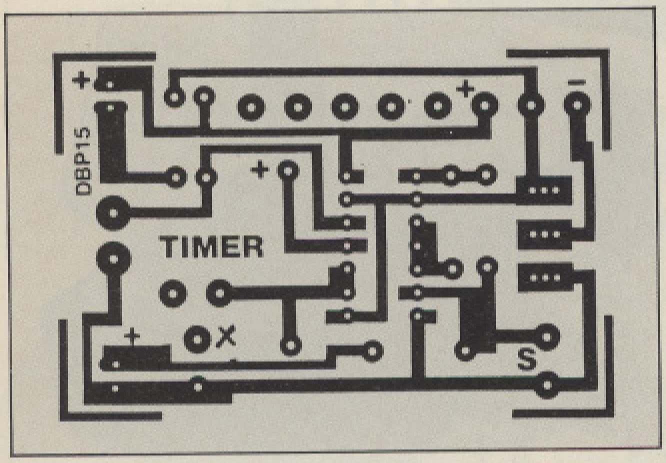


Figure II: The PCB (full size)

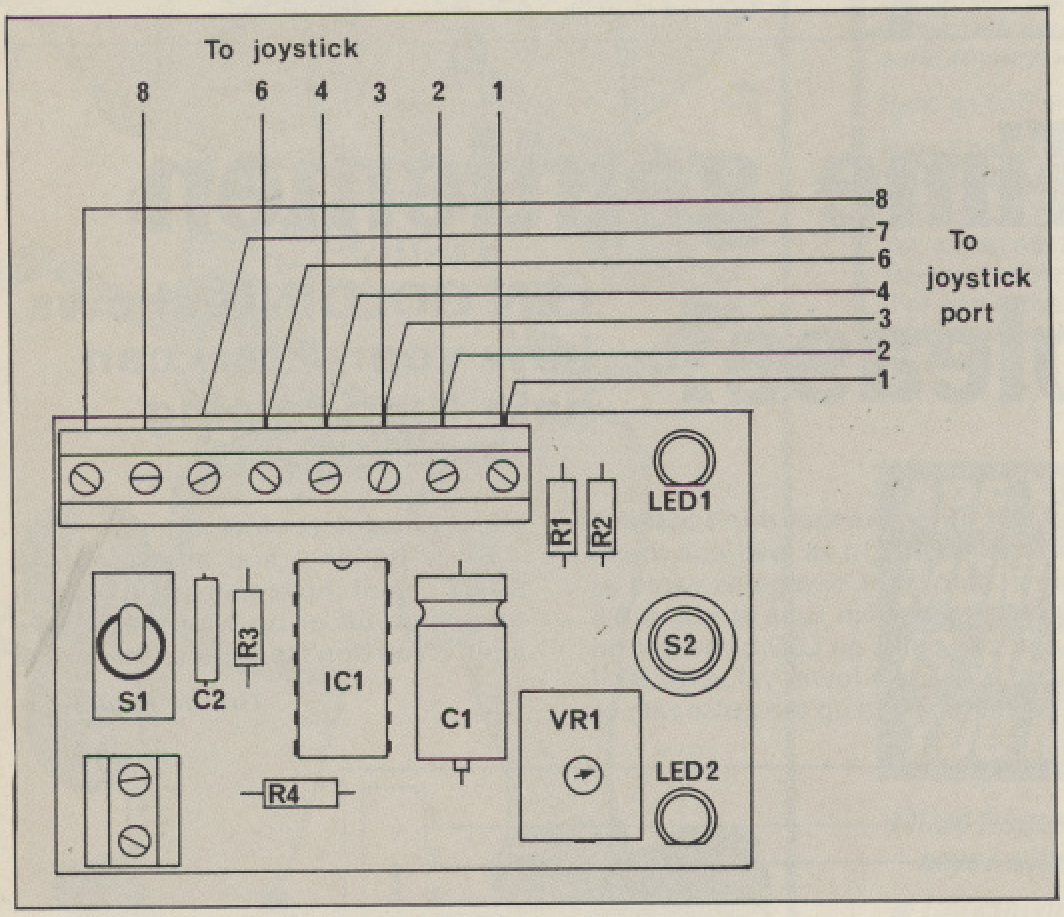


Figure III: Component layout for de-luxe version

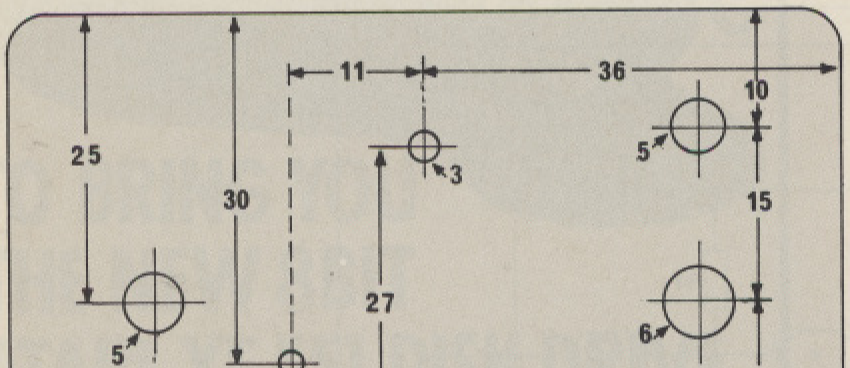


Figure IV: The position of the holes in the case top

assembled PCB and fix the buzzer in position, running its leads through the 2mm hole.

Finally insert IC1 into its socket – making sure it's the right way round – connect the buzzer and joystick wires and assemble everything into the case.

Plug the gadget into either joystick port and experiment with VR1 until you get a time delay that suits you, then screw on the case lid.

Your timer will operate consistently and accurately every time you push the button.

PARTS REQUIRED

		Maplin Code
R1	100k brown/black/yellow	M100K
R2	270 ohm red/violet/brown	M270R *
R3	1 megohm brown/black/green	M1M *
R4	270 ohm red/violet/brown	M270R
VR1	4.7 meg horizontal preset	UH11M
C1	100 mfd 10v axial	FB48C
C2	0.22 mfd polyester layer	WW45Y *
IC1	74AC00 quad NAND gate	UH67X
	14-pin DIL socket	BL18U *
LED1,2	5mm red LED	WL27E *
S1	SPDT centre-off switch	FH01B *
S2	Push-to-make switch	FH59P
	6v 15mA buzzer	FL39N *
	8-way terminal block	RK38R *
	2-way terminal block	FT38R *
	Verobox type 301	LL12N *

** These components are optional – see text.*

All components available from: Maplin Electronic Supplies, PO Box 3, Rayleigh, Essex, SS6 2BR.

Ready-drilled PCB and joystick extension lead available from RH Design, 137 Stonefall Avenue, Harrogate, North Yorks. Tel 0423 880520. Prices including VAT and postage:

PCB (order code DBP15)	£1.48
Joystick extension lead	£2.99

ATARI USER Classifieds

Has upgrading your computer given you hardware you no longer need? Or have changing interests left you with unwanted software? Then THIS is the place to advertise your surplus items. *Atari User* readers are always on the lookout for a bargain and this is the first place they look!

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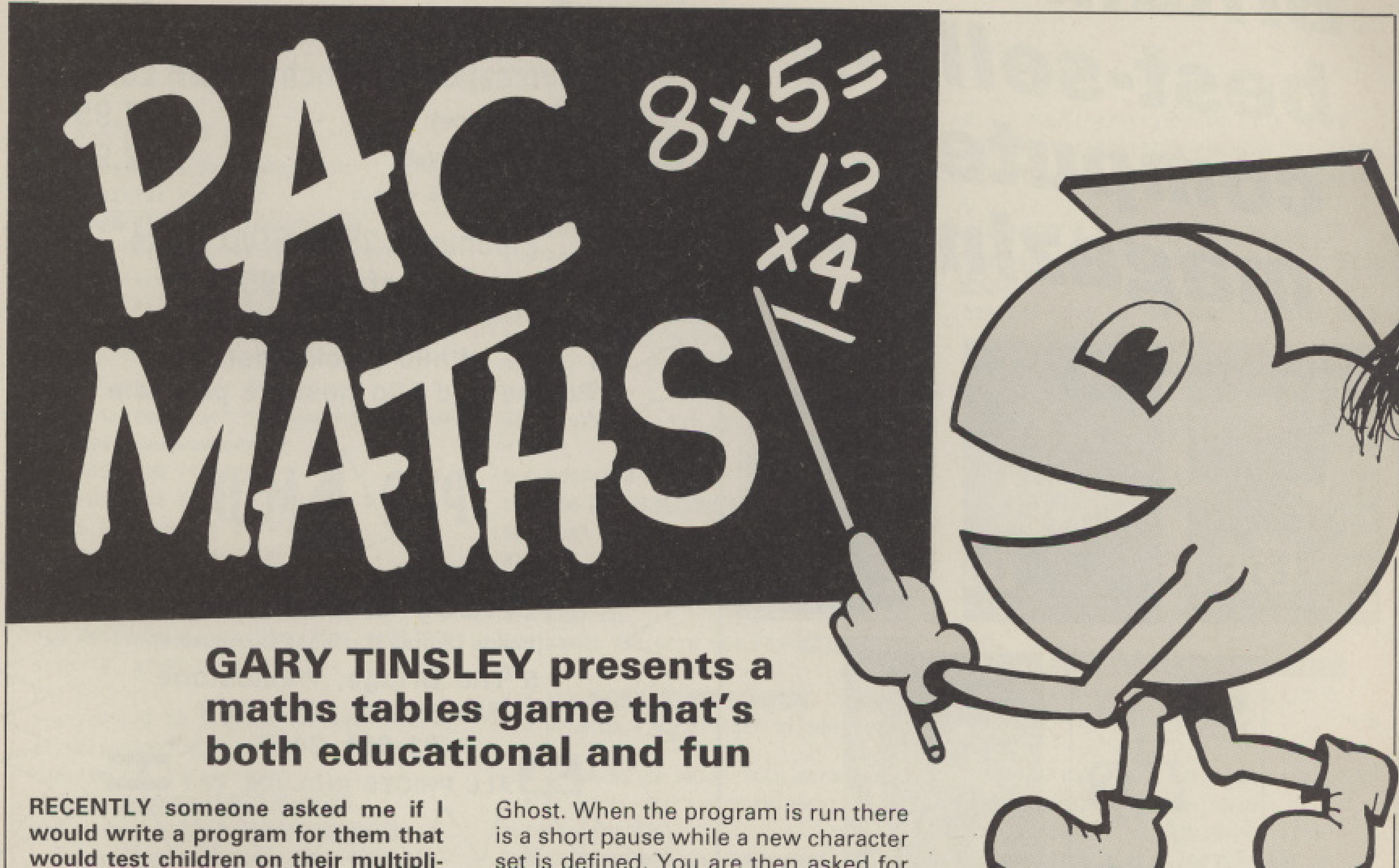
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PAC MATHS



GARY TINSLEY presents a maths tables game that's both educational and fun

RECENTLY someone asked me if I would write a program for them that would test children on their multiplication tables, but at the same time be fun to play.

After a few hours of brain ache I presented them with Pac-maths, which as you may have guessed, is based on the very popular arcade game of Pac-man, complete with the hungry Pac-man and the chasing Ghost. When the program is run there is a short pause while a new character set is defined. You are then asked for the number of the multiplication table that you are to be tested on (answer from 2 to 82).

You are then asked for the speed level and you reply between 1 for the fastest level and 5 for the slowest. The speed is how fast the Ghost will chase the Pac-man if you delay in answering the question.

The child is then presented with the first of 12 random questions. He must select the correct answer from a choice of three possible answers given on the screen by choosing A, B or C. If the correct answer is chosen the Pac-man will advance one place towards the Powerpill and if he reaches it the Ghost will turn blue with fright and the Pac-man will eat him.

If the child chooses the wrong answer the Ghost moves one place towards the Pac-man and if he reaches the Pac-man he will get his own back and eat him instead.

VARIABLES

DL	Start address of display list
L,L1	Loops
CH	Location of new character set POKE 756,CH
CHB	RAMTOP where the new character set will be placed
SPEED	How fast the Ghost will chase the Pac-man
PACMANX	X position across the screen of the Pac man
GHOSTX	X position across the screen of the Ghost
MULT	The multiplication table to be tested on
MULTNUM	The number to multiply MULT by
R	Random answer position 1=A 2=B and 3=C
RA1,RA2	Random answers for the other two positions
GL	Actual game input loop
WW	Contains the Atascii value of the answer entered by the child
D	Data variable
CHSET$	Contains the machine code to move rom character set in to ram
ANSWERED	Array containing 1 if question is answered correctly or 0 if it is answered wrongly or has not been asked yet

```
10 REM  PAC-MATHS BY
20 REM  GARY TINSLEY
30 REM  (C)ATARI USER
40 REM
50 REM  SETUP NEW DISPLAY
60 GRAPHICS 17:DL=PEEK(560)+256*PEEK(5
61)+6:POKE DL-3,71:FOR L=1 TO 6:POKE D
L+L,4:NEXT L:POKE DL+21,2:POKE 87,0
70 REM  SETUP VARIBLES & COLOURS
80 POKE 106,PEEK(106)-8:POKE 752,1:POK
E 82,0:POKE 708,10:POKE 710,132:DIM AN
SWERED(12),CHSET$(34)
90 CHB=PEEK(106)-8:CH=CHB*256:MULT=0:W
W=0:D=0:SPEED=0:MULTNUM=0
100 REM  DRAW GAME SCREEN
```

Turn to Page 59 ►

◄ From Page 57

```
110 POSITION 5,0:? "pAc-mAtHs"
120 POSITION 2,14:? "          PLEASE WAIT A MOMENT          ":GOSUB 1080
130 FOR L=1 TO 12:ANSWERED(L)=0:NEXT L:PACMANX=0:GHOSTX=0:POKE 711,54
140 FOR L=1 TO 13:POSITION 0,L:? "                                        ":NEXT L
150 POSITION 5,0:? "PAC-MATHS"
160 POSITION 0,1:? "wwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwy"
170 POSITION 39,2:? "v"
180 POSITION 0,3:? "    b b b b b b b b b b b b b b b b a  v"
190 POSITION 39,4:? "v"
200 POSITION 0,5:? "wwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwz"
210 POSITION 2,14:? "(C)1987  GARY TINSLEY  &  ATARI USER":FOR L=1 TO 1000:NEXT L
220 FOR L=1 TO 4:GOSUB 900:NEXT L:GOSUB 750:GOSUB 750
230 FOR L=1 TO 500:NEXT L
240 REM  WHICH TABLE & LEVEL
250 POSITION 3,8:? "Which x table"
260 TRAP 260:POSITION 6,9:? "2-82←←←←";:INPUT MULT:IF MULT<2 OR MULT>82 THEN GOTO 260
270 MULT=INT(MULT):POSITION 3,8:? "speed  level "
280 TRAP 280:POSITION 6,9:? "1-5     ←←←←";:INPUT SPEED:IF SPEED<1 OR SPEED>5 THEN GOTO 270
290 REM  INSTRUCTIONS TO CHILD
300 POSITION 1,8:? "get the PACMAN to":POSITION 3,9:? "the POWER pill"
310 FOR L=1 TO 8:POSITION 36,3:? " ":FOR L1=1 TO 50:SOUND 0,100,10,6:NEXT L1
320 POSITION 36,3:? "a":FOR L1=1 TO 50:SOUND 0,80,10,6:NEXT L1:NEXT L:SOUND 0,0,0,0
330 REM  CLR ANSWERED(n),CHOOSE QUEST          PRINT QUEST & ANSWERS
340 FOR L=1 TO 12:ANSWERED(L)=0:NEXT L:GOSUB 900
350 REM  HAS QUEST. BEEN ASKED
360 MULTNUM=INT(RND(0)*12+1):IF ANSWERED(MULTNUM)=1 THEN 360
370 FOR L=6 TO 13:POSITION 0,L:? "                                        ":NEXT L
380 ANSWERED(MULTNUM)=1
390 REM  CHOOSE RANDOM ANSWERS & POS.
400 R=INT(RND(0)*3+1)
410 RA1=INT(RND(0)*2+1):RA2=INT(RND(0)*2-1):IF RA1=RA2 THEN GOTO 410
420 IF R=1 THEN A1=MULTNUM*MULT:A2=A1+RA1:A3=A1+RA2
430 IF R=2 THEN A2=MULTNUM*MULT:A1=A2-RA2:A3=A2+RA1
440 IF R=3 THEN A3=MULTNUM*MULT:A1=A3+RA2:A2=A3-RA1
450 IF A1=A2 OR A1=A3 OR A2=A3 THEN GOTO 410
460 IF A1<1 OR A2<1 OR A3<1 THEN GOTO 410
470 POSITION 0,12:? "a ";A1;"  "
480 POSITION 8,12:? "b ";A2;"  "
490 POSITION 15,12:? "c ";A3;"  "
500 POSITION 35,7:? "X";MULTNUM;:IF MULTNUM<10 THEN ? "← ";MULTNUM
510 POSITION 1,7:? "what is          ";MULT;:IF MULT<10 THEN ? "← ";MULT
520 POSITION 5,8:? "               _____"
530 POSITION 1,9:? MULTNUM;" X ";MULT;" =  "
540 POSITION 25,9:? "           _____"
550 REM  CHECK FOR KEYBOARD INPUT
560 POKE 764,255
570 FOR GL=1 TO SPEED*50
580 IF PEEK(764)<>255 THEN GOTO 610
590 NEXT GL
600 GOSUB 750:GOTO 560:REM  MOVE GHOST
610 REM  IS INPUT CORRECT ?
620 OPEN #1,4,0,"K:":GET #1,WW:CLOSE #1
630 IF WW<65 OR WW>67 THEN GOTO 560
640 IF WW=65 AND R=1 THEN POSITION 15,9:? A1:GOTO 730
650 IF WW=66 AND R=2 THEN POSITION 15,9:? A2:GOTO 730
660 IF WW=67 AND R=3 THEN POSITION 15,9:? A3:GOTO 730
670 REM  WRONG ANSWER !!!!
680 FOR L=1 TO 5:POSITION 0,12:? " wrong- the answer              is  ";MULT*MULTNUM
690 FOR L1=1 TO 50:SOUND 0,L1,12,10:NEXT L1
700 POSITION 0,12:? "                                        "
710 FOR L1=1 TO 20:SOUND 0,L1,12,10:NEXT L1:SOUND 0,0,0,0:NEXT L:ANSWERED(MULTNUM)=0:GOSUB 750:GOTO 360
720 REM  ANSWER CORRECT !!
730 FOR L=1 TO 3:POSITION 0,12:? "   right !       ":FOR L1=50 TO 1 STEP -1:SOUND 0,L1,10,10:NEXT L1
740 POSITION 0,12:? "                ":FOR L1=1 TO 50:NEXT L1:NEXT L:GOSUB 900:GOTO 360
750 REM  MOVE GHOST 1 POSITION
760 GHOSTX=GHOSTX+1:SOUND 0,GHOSTX*5,10,10
770 POSITION GHOSTX,2:? " mno↓←←←← pqr↓←←←← stu":SOUND 0,(GHOSTX*5)+5,10,10:FOR L=1 TO 10:NEXT L:SOUND 0,0,0,0
780 IF GHOSTX<>PACMANX-2 THEN RETURN
790 REM  GHOST REACHES PACMAN
800 FOR L=6 TO 13:POSITION 0,L:? "                                        ":NEXT L:PACMANX=PACMANX+2
810 POSITION 3,8:? "the ghost has"
820 POSITION 3,9:? "got the pacman"
830 POSITION 5,11:? "GAME OVER"
840 FOR L=75 TO 150 STEP 4:SOUND 0,L,10,10:SOUND 1,L+2,10.10:POSITION PACMANX,2:? "dh↓←←gf↓←←ji":FOR L1=1 TO 10
850 NEXT L1:POSITION PACMANX,2:? "ic↓←←je↓←←ik":FOR L1=1 TO 10:NEXT L1:NEXT L
860 SOUND 0,0,0,0:SOUND 1,0,0,0
870 FOR L=1 TO 6:POSITION 5,11:? "GAME OVER"
880 FOR L1=1 TO 100:NEXT L1:POSITION 5,11:? "game over"
890 FOR L1=1 TO 100:NEXT L1:NEXT L:GOTO 130
900 REM  MOVE PACMAN ONE POSITION
910 PACMANX=PACMANX+1:POSITION PACMANX,2:? " cde↓←←←← fxl↓←←←← ijk"
920 FOR L1=1 TO 20:SOUND 0,L1,12,10:NEXT L1:SOUND 0,0,0,0
930 PACMANX=PACMANX+1:POSITION PACMANX,2:? " cde↓←←←← fgh↓←←←← ijk":FOR L1=1 TO 20:NEXT L1:IF PACMANX<>34 THEN RETURN
940 REM  PACMAN REACHES POWER PILL
950 FOR L=6 TO 13:POSITION 0,L:? "                                        ":NEXT L
960 POSITION 2,8:? "the pacman has":POSITION 3,9:? "reached  the"
970 POSITION 3,10:? "power pill !"
980 POSITION 3,12:? "WELL  DONE !"
990 FOR L=1 TO 3:FOR L1=100 TO 50 STEP -2:SOUND 0,L1+RND(0)*10,10,10:SOUND 1,L1,10,10:NEXT L1
1000 FOR L1=50 TO 100 STEP 2:SOUND 0,L1+RND(0)*10,10,10:SOUND 1,L1,10,10:NEXT L1:NEXT L:SOUND 0,0,0,0
1010 SOUND 1,0,0,0:POKE 711,150
1020 FOR L=PACMANX TO (GHOSTX+3) STEP -1
1030 POSITION L,2:? "cde ↓←←←←fxl ↓←←←←ijk "
1040 FOR L1=1 TO 20:SOUND 0,L1,12,10:NEXT L1:SOUND 0,0,0,0:NEXT L
1050 FOR L=75 TO 150 STEP 4:SOUND 0,L,12,10:SOUND 1,L+2,12,10:POSITION GHOSTX+1,2:? "st↓←←qr↓←←no":FOR L1=1 TO 10
1060 NEXT L1:POSITION GHOSTX+1,2:? "ps↓←←ur↓←←tp":FOR L1=1 TO 10:NEXT L1:NEXT L
1070 SOUND 0,0,0,0:POSITION GHOSTX+1,2:? "  ↓←←  ↓←←  ↓←←":FOR L=1 TO 1000:NEXT L:GOTO 130
1080 REM  NEW CHARACTER SET
1090 CHSET$="h)♥,K,M)←,Lhh,N"H ♥iK,HHPyfLfNJPn♦":A=USR(ADR(CHSET$),CHB)
1100 FOR L=97 TO 122:FOR L1=0 TO 7:READ D:POKE CH+L1+8*L,D:NEXT L1:NEXT L:POKE 756,CHB:RETURN
1110 DATA 20,85,69,81,69,81,85,20
1120 DATA 0,0,36,36,24,24,0,0
1130 DATA 0,0,0,0,0,2,2,10
1140 DATA 0,0,0,168,168,170,170,170
1150 DATA 0,0,0,0,0,0,0,128
1160 DATA 10,42,42,42,42,42,42,42
1170 DATA 170,170,170,170,128,160,168,170
```

◀ From Page 59

```
1180 DATA 128,160,160,160,0,0,0,0
1190 DATA 10,10,2,2,0,0,0,0
1200 DATA 170,170,170,170,168,168,0,0
1210 DATA 128,128,0,0,0,0,0,0
1220 DATA 128,160,160,160,160,160,160,
160
1230 DATA 0,0,3,15,63,63,60,60
1240 DATA 0,252,255,255,255,255,124,12
4
1250 DATA 0,0,0,192,240,240,112,112
1260 DATA 61,63,63,63,63,63,63,61
1270 DATA 125,255,255,255,255,255,255,
221
1280 DATA 112,240,240,240,240,240,240,
240
1290 DATA 63,63,63,63,63,63,51,51
1300 DATA 119,255,255,255,255,255,51,5
1
1310 DATA 240,240,240,240,240,240,48,4
8
1320 DATA 51,51,51,51,51,51,51,51
1330 DATA 0,255,255,0,0,255,255,0
1340 DATA 170,170,170,170,170,170,170,
170
1350 DATA 0,255,255,3,3,243,243,51
1360 DATA 51,243,243,3,3,255,255,0
```

Get it right!

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
10	8592	20	8888	30	8587
40	871	50	11886	60	19754
70	16092	80	16892	90	11522
100	10923	110	5553	120	10781
130	12430	140	10706	150	5073
160	17381	170	3723	180	10477
190	3731	200	17395	210	13958
220	9406	230	3901	240	12488
250	12311	260	17544	270	14696
280	16740	290	13974	300	18879
310	12906	320	14239	330	31746
340	8558	350	13666	360	10836
370	10721	380	4127	390	18023
400	3069	410	11504	420	8810
430	8834	440	8848	450	6922

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
460	6220	470	5295	480	5311
490	5662	500	11953	510	12479
520	5410	530	7414	540	5491
550	15890	560	2121	570	3621
580	5431	590	1569	600	11377
610	12347	620	6049	630	5651
640	9214	650	9221	660	9228
670	11216	680	22776	690	7004
700	6913	710	18698	720	11532
730	17204	740	14445	750	13871
760	7580	770	23982	780	6857
790	13147	800	14536	810	12722
820	12701	830	8525	840	18833
850	14031	860	4713	870	11292
880	13836	890	7211	900	16076

LINE	CHSUM	LINE	CHSUM	LINE	CHSUM
910	12397	920	9339	930	22197
940	16311	950	10721	960	13997
970	6388	980	5324	990	15574
1000	17016	1010	4383	1020	6666
1030	7249	1040	10681	1050	21424
1060	17556	1070	14573	1080	11404
1090	23326	1100	16575	1110	4536
1120	3887	1130	3233	1140	4749
1150	3393	1160	4418	1170	5585
1180	4378	1190	3395	1200	5016
1210	3861	1220	5545	1230	3963
1240	5474	1250	4660	1260	4489
1270	5625	1280	5503	1290	4485
1300	5489	1310	5418	1320	4432
1330	4425	1340	5546	1350	4695
				1360	4670

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We are pleased to announce a new reduced price point on the 1040ST-F which is now available for only £499 (inc VAT). The 1040 is a powerful computer with 1Mb of RAM and also includes a built-in 1Mb double sided 3½" disk drive. The 1040 has been designed for use on business and professional applications most of which require a high resolution monochrome or colour monitor. It does not therefore have an RF modulator for use with a domestic TV set. Modulators can be fitted for £49 (inc VAT).

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ATARI ST

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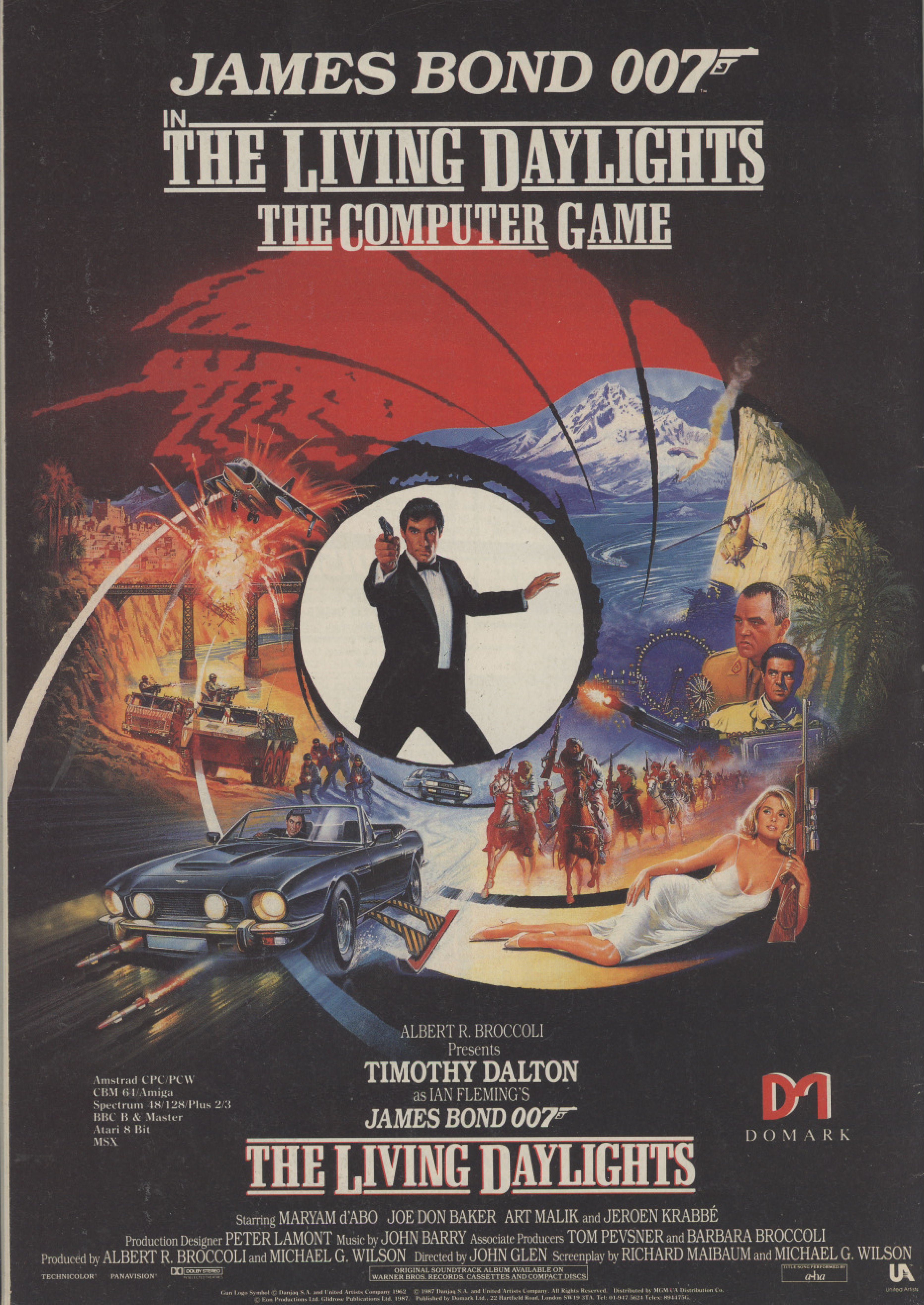
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